FILE NO.

SANYO

SERVICE MANUAL

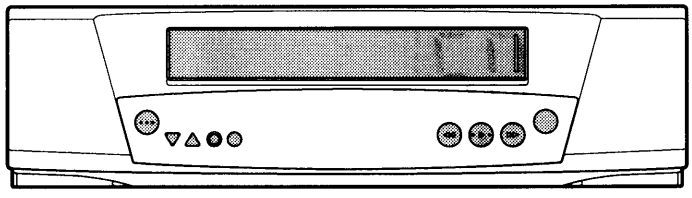
Video Cassette Recorder

VHR-779E

(Product Code : 143 179 00)
(U.K.)

VHR-789E

(Product Code : 143 179 29)
(U.K.)



(VHR-779E)

VHS
PAL

CONTENTS

1. DISASSEMBLY 5
2. ELECTRICAL ADJUSTMENT 9
3. TEST POINTS FOR TAPE PATH ADJUSTMENT 11
4. PARTS LIST
   MECHANISM PARTS 12
   ACCESSORIES 14
   PACKING MATERIALS 14
   CABINET & CHASSIS PARTS 14
   ELECTRICAL PARTS 15

CIRCUIT DIAGRAMS (Refer to the separate volume)

Please see other materials with Reference number given in table below.

Materials	Model No.	Reference No.
Mechanism Manual	VC Mechanism	MM531683

PRODUCT SAFETY NOTICE

The components designated by a symbol (⚠) in this schematic diagram designates components whose value are of special significance to product safety. Should any component designated by a symbol need to be replaced, use only the part designated in the parts List. Do not deviate from the resistance, wattage, and voltage ratings shown.

NOTE: 1. Parts order must contain model number, part number, and description.
2. Substitute parts may be supplied as the service parts.
3. N.S.P. : Not available as service parts.

Design and specifications are subject to change without notice.

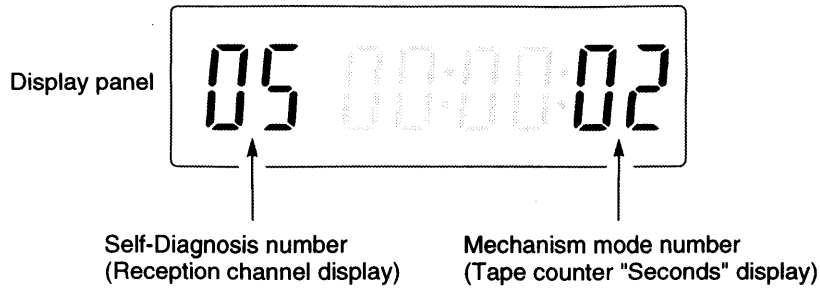
SELF-DIAGNOSIS DISPLAY

Mechanism Mode Display / Head Output Drop Warning Display

This unit displays the diagnosis contents of abnormalities and the mechanism mode on its display panel in 2-digit numbers.
When the head playback output has dropped, the "L" sign will be blinked.
These display shows the outline of the problems. Use it as a reference when servicing the unit.

1. Self-Diagnosis Contents and Mechanism Mode Display

- When the STOP button on the remote control is pressed for about 10 seconds continuously, the self-diagnosis number will be displayed on the reception channel display of the display panel and number indicating the failed mechanism mode (changed mode when being shifted) on the tape counter "seconds" display for 10 seconds each.
- During self-diagnosis display, displays other than the diagnosis number/mechanism mode number will be turned off and when displays end, the normal display will be returned automatically.
- Refer to "Self-Diagnosis Contents" for the self-diagnosis numbers and the "Mechanism Mode Display Contents" for the mechanism mode numbers.
- When the "0" button on the remote control unit is pressed during display, and clearing the self-diagnosis display and mechanism mode display.



Self-Diagnosis Contents

No.	Problem	Main Possible Cause	Mechanism Operations and State After Occurrence
00	There is no abnormality in the mechanism.		
01	The cylinder motor does not rotate.	• The cylinder motor is faulty. • The control of the cylinder motor is faulty. • The tape winds around the cylinder.	Shifts to the STANDBY mode, and the power goes off.
02	The take-up reel or supply reel does not rotate.	• The take-up reel or supply reel is caught. • The reel belt is faulty. • The reel torque has decreased.	Shifts to the STANDBY mode, and the power goes off.
03	The capstan motor does not rotate.	• The capstan motor is faulty. • The control of the capstan motor is faulty.	Shifts to the STANDBY mode, and the power goes off.
04	The tape cannot be loaded with the cassette inserted. (But unloading can be performed.)	• Error in the operations of the tape loading mechanism. • Foreign particles in the tape loading mechanism. • The tape end sensor is faulty. • The reel brake of the tape cassette has not been released.	Unloads, shifts to the INITIAL mode, and the power goes off.
05	Tape loading and unloading cannot be performed with the cassette inserted.	• The tape guide is caught. • The loading motor is faulty. • The control of the loading motor is faulty.	The power is forcibly turned off with the mechanism at its current position.

No.	Problem	Main Possible Cause	Mechanism Operations and State After Occurrence
06	Front unloading cannot be performed when ejecting the cassette. (Front loading can be performed.)	• The cassette drive mechanism is faulty. • The front door is caught.	Front loads and shifts to the STOP or INITIAL mode. • When the power switch is turned on before eject operations: Shifts to the STOP mode. • When the power switch is turned off before eject operations: Shifts to the INITIAL mode and the power goes off.
07	Front loading and front unloading cannot be performed when ejecting the cassette.	• The tape cassette is caught in the cassette drive mechanism. • The main cam and front rack gear of the front loading mechanism have not engaged properly. • The gears of the front loading drive mechanism have not engaged properly.	The power is forcibly turned off with the mechanism at its current position.
08	The mechanism becomes 1 (REVIEW) while moving from 2 (IDLER), 3 (STILL), 4 (BRAKE), and to 5 (STOP).	• The mechanism mode switch contact is faulty.	The power is forcibly turned off with the mechanism at its current position.
09	The mechanism becomes 7 (INITIAL) while moving from 1 (REVIEW), 2 (IDLER), 3 (STILL), 4 (BRAKE), and to 5 (STOP).	• The mechanism mode switch contact is faulty.	Carries out tape take-up operations, shifts to the STANDBY mode, and the power goes off.
10	The capstan motor does not rotate and cassette tape eject when cassette tape insert.	• The capstan motor is faulty. • The control of the capstan motor is faulty.	Shifts to the EJECT mode. Protect cassette tape.
11	The cylinder motor does not rotate and cassette tape eject when cassette tape insert.	• The cylinder motor is faulty. • The control of the cylinder motor is faulty.	Shifts to the EJECT mode. Protect cassette tape.
12	The supply reel does not rotate and cassette tape eject when tape unloading.	• The supply reel is caught. • The reel belt is faulty. • The reel torque has decreased.	Shifts to the EJECT mode. Protect cassette tape.

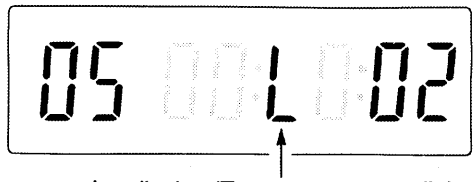
Note: For details of mechanism operations corresponding to the mechanism positions of the self-diagnosis numbers 08 and 09 above, refer to the separate volume on the VC mechanism manual. These manual reference numbers are shown in the cover.

Mechanism Mode Display Contents

Mode No.	Mechanism Mode	Mode No.	Mechanism Mode	Mode No.	Mechanism Mode
00	CASSETTE OUT	07	SLOW	14	FAST FORWARD
01	STANDBY	08	PLAY	15	REWIND
02	STOP	09	REC	16	VIDEO INSERT
03	STILL	10	AUDIO DUBBING	17	VIDEO INSERT-PAUSE
04	REC-PAUSE	11	X2 SPEED PLAY	18	AUDIO/VIDEO INSERT
05	AUDIO DUBBING-PAUSE	12	CUE	19	REVERSE X2 SPEED PLAY
06	FRAME ADVANCE	13	REVIEW	99	OTHERS

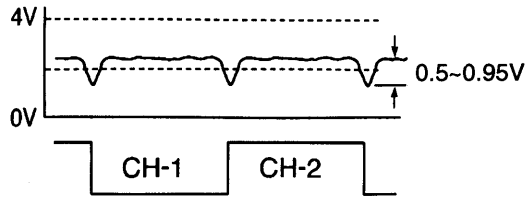
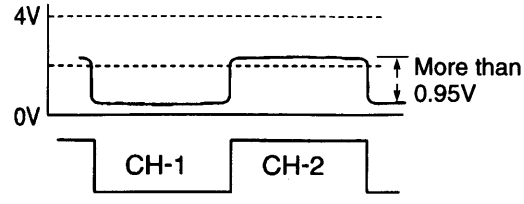
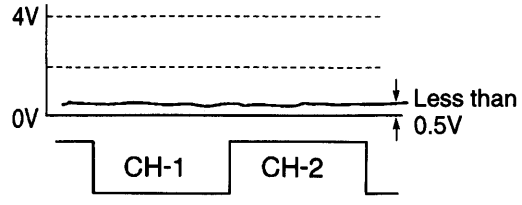
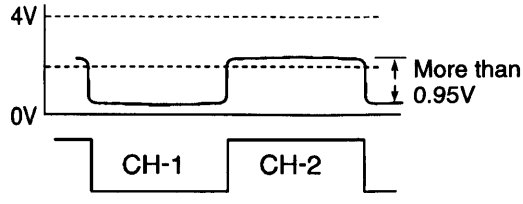
2. Head Output Drop Warning Display

- When the STOP button on the remote control is pressed for 10 seconds continuously 10 seconds after play starts, "L" will be displayed blinking at the first digit of the minutes position on the tape counter when the head output is lower than the specified value to indicate an abnormality.
- The cause of the abnormality may be due to drop in the playback output caused by drop in the efficiency of the cassette used or head clogging. Refer to "Head Playback Output Voltage Check" as a means to judge the abnormality.

Display panel 

Head output drop warning display (Tape counter "1st digit of Minutes." position)

Head playback output voltage check

Cassette Used	Warning Display	Envelope Detection Output Voltage	Main Cause
Cassette with normal playback output	–	Envelope detection output (IC301 Pin 85 or C3016 HOT side: see Fig. 2-1-1) Switching pulse (TP183: see Fig. 2-1-1) 	When the output voltage difference of the two channels is 0.5 to 0.95V • The video heads of both are normal
Recorded cassette (with tabs)	"L" blinking	Envelope detection output (IC301 Pin 85 or C3016 HOT side: see Fig. 2-1-1) Switching pulse (TP183: see Fig. 2-1-1) 	When the output voltage difference of the two channels is more than 0.95V • Tracking adjustment has not been performed accurately • One video head is clogged • One video head has worn out
	"L" blinking	Envelope detection output (IC301 Pin 85 or C3016 HOT side: see Fig. 2-1-1) Switching pulse (TP183: see Fig. 2-1-1) 	When the average outputvoltage of the two channels is less than 0.5V • Tracking adjustment has not been performed accurately • Both video heads are clogged • Both video heads have worn out
Rental cassette (without tabs)	"L" blinking	Envelope detection output (IC301 Pin 85 or C3016 HOT side: see Fig. 2-1-1) Switching pulse (TP183: see Fig. 2-1-1) 	When the output voltage difference of the two channels is more than 0.95V • Tracking adjustment has not been performed accurately • One video head is clogged • One video head has worn out
	• Some rental cassettes may have extremely low video playback outputs even when both video heads are normal. As the average output voltage of the two heads may be less than 0.5V for some, no warning displays will be shown.		

1. DISASSEMBLY

1-1. REMOVAL OF CABINET, MECHANISM UNIT, AND MAIN BOARD

REMOVING THE CABINET PARTS (Fig. 1-1-1)

1. Remove the cabinet by removing the four screws (1).
2. Remove the front panel by removing the locks of the clamps (A) using a screwdriver, etc. and slightly rotating the bottom part in the direction of the arrow.

Notes: • Electrical adjustments for the this model can be performed with only the cabinet removed.

REMOVING THE MECHANISM MAIN UNIT AND THE CP-1 PWB ASSEMBLY (Fig. 1-1-2 and 1-1-3)

After removing the cabinet parts, remove the mechanism unit and the CP-1 PWB assembly connected as follows.

1. Remove the five screws (2) as shown in Fig. 1-1-2.
2. Remove the two screws (3) at the CP-1 board, and then disconnect the bottom cover.
3. Remove the two screws (4) and two screws (5) of the mechanism unit. The two screws (5) of the cassette tray can be removed easily by pushing the lid opener lever in the arrow direction to remove the lock as shown in the enlarge view.
4. Lift up the whole mechanism unit and main board (CP-1 PWB assembly), and as shown in Fig. 1-1-3, so that they can be removed from the chassis.

M-SE2L/E2-1

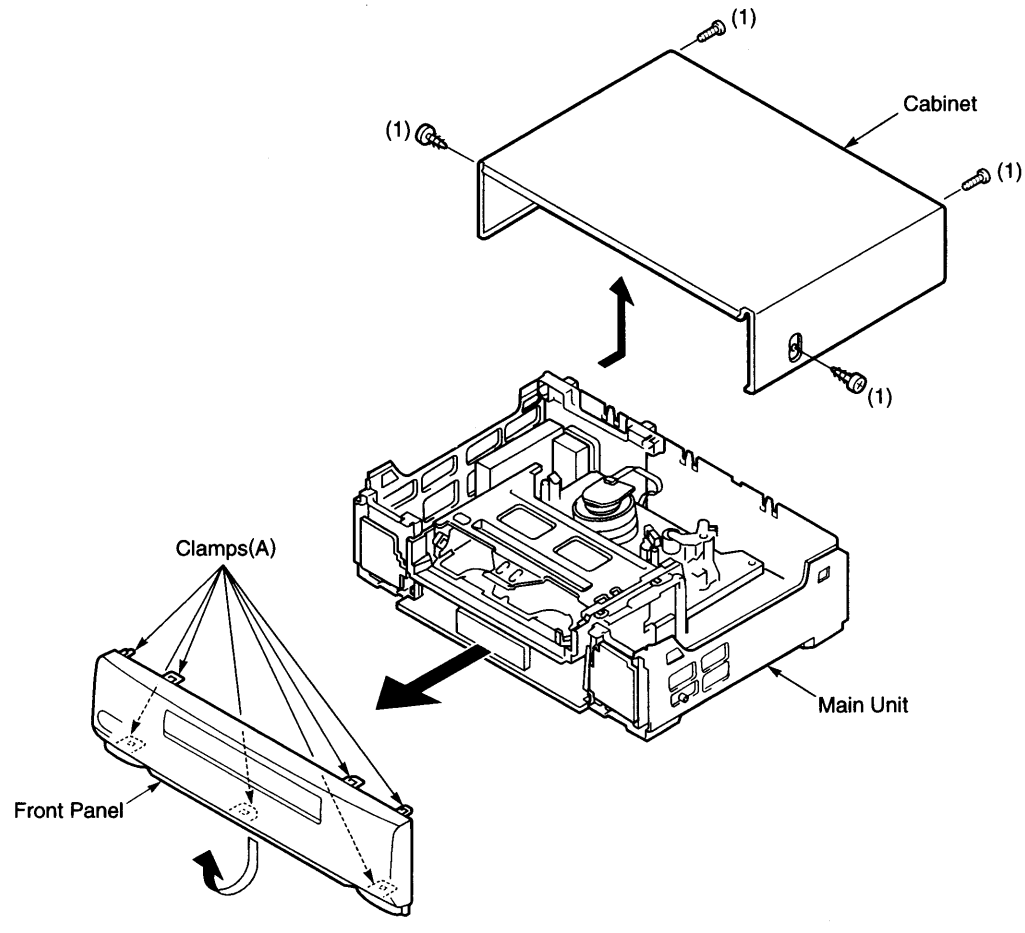


Fig. 1-1-1

M-SE2L/E2-2

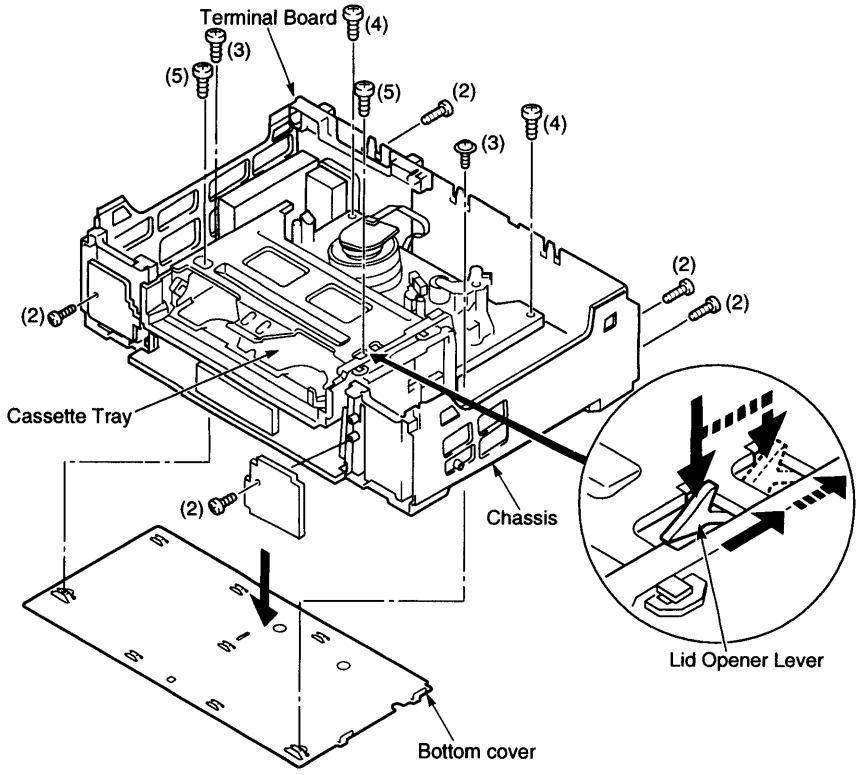


Fig. 1-1-2

M-SE2L/E2-3

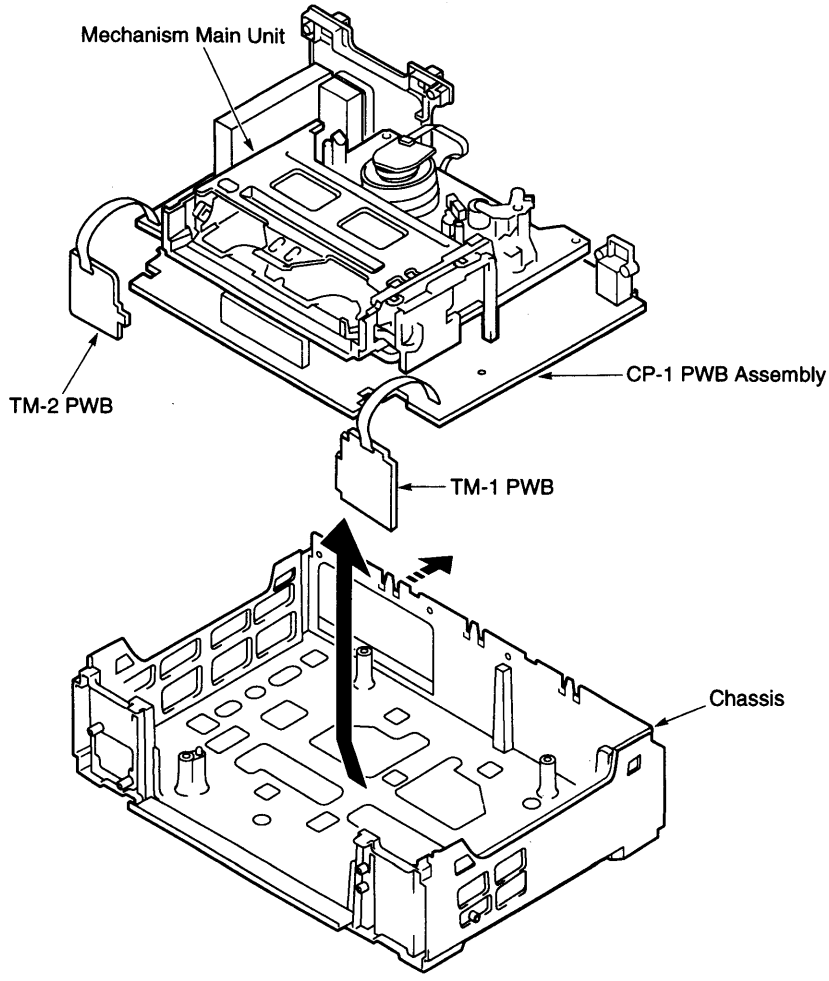


Fig. 1-1-3

1-2. TEMPORARILY SETTING UP AND CONNECTING CP-1 PWB ASSEMBLY

The following is an example of how to place and connect the main board without a jig, when repairing the CP-1 PWB assembly.

1. Place the mechanism unit and main board up side down as a whole on a flat surface with foil side of the main board facing up.
2. Operete the unit using the buttons on CP-1 PWB or the remote control.

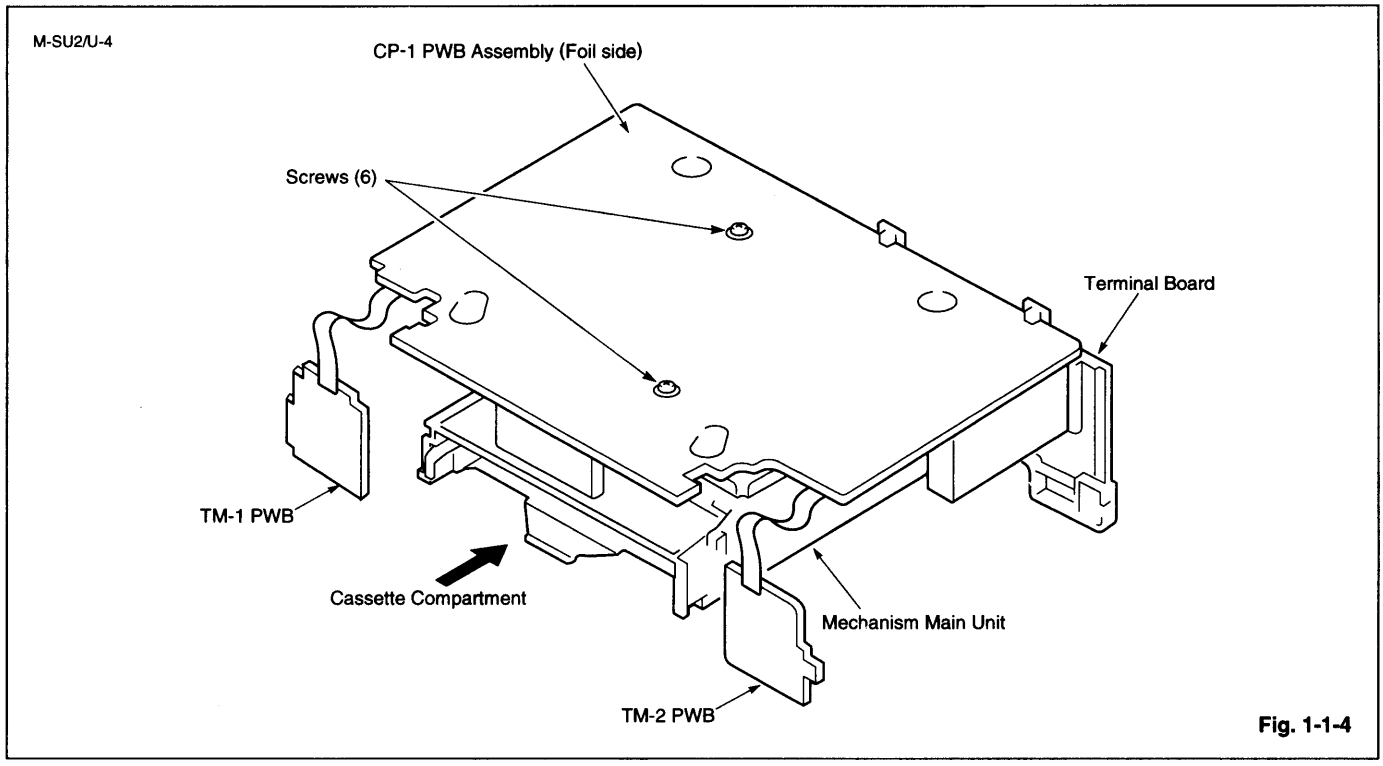


Fig. 1-1-4

1-3. INSTALLATION OF THE FRONT PANEL

When installing the front panel to the chassis after repaires and adjustments.

1. Pressing down the door opener lever of the mechanism main unit.
2. Set the cassette door to half-opened state as shown in Fig. 1-1-5, and install the front panel to the chassis.

Note: Opened cassette door position does not install the front panel to the chassis.

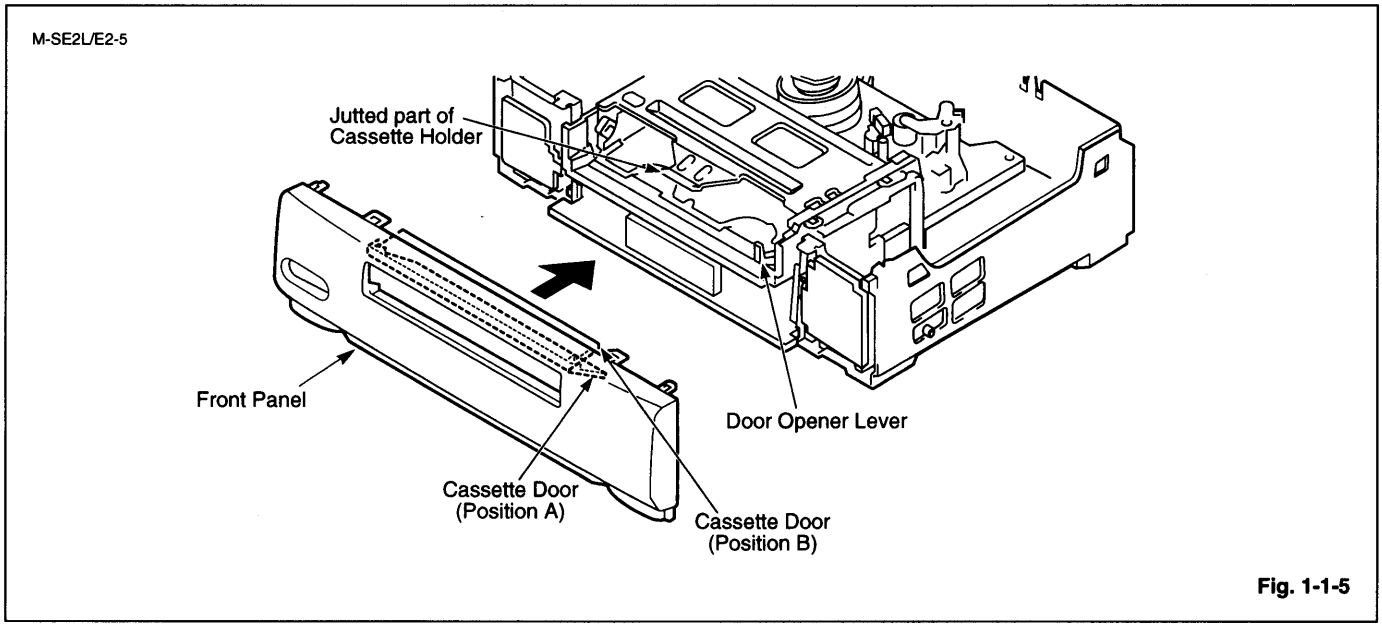


Fig. 1-1-5

Note: Before assembling the mechanism unit and the CP-1 board, check the eject mode positioning marks as shown in Fig. 1-1-6 and Fig. 1-1-7.

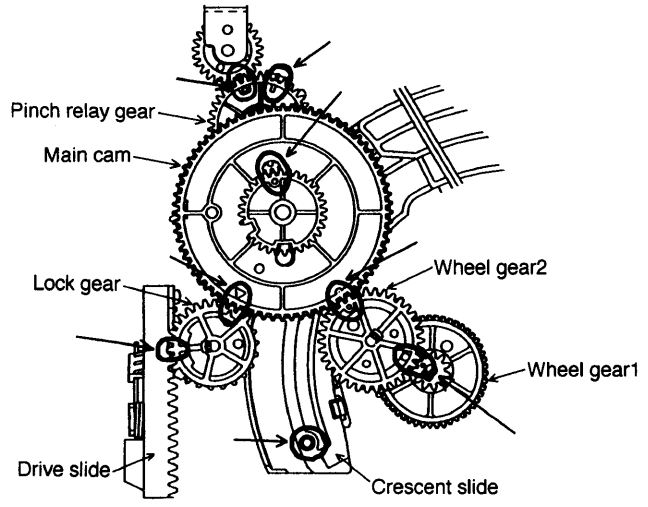


Fig. 1-1-6

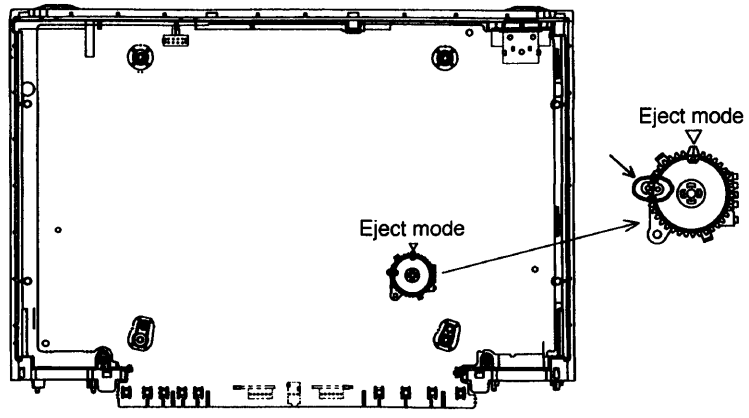
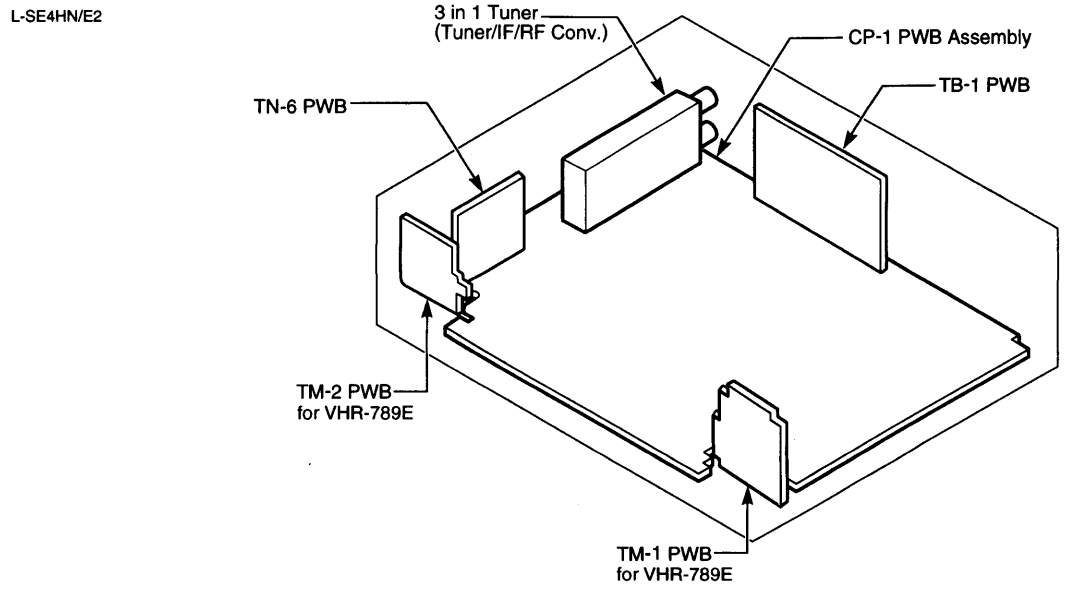


Fig. 1-1-7

1-4. CIRCUIT BOARD LOCATIONS



2. ELECTRICAL ADJUSTMENT

VCR PRESETTING

This VCR need three basic presetting by using the menus displayed on-screen. After all connection have been made, then follow steps 1 to 3 to preset the VCR.
The three presetting steps will be displayed in sequence on TV screen. The setting are entered with the remote control.

Turn on the VCR

1. Adjusting the TV receiver to the video channel: The AUTO SETUP screen will appear. When the video channel has been preset, press the OK button on the remote control.
2. Country selection: Using the numeric button, select the country of use.
3. Language selection: When the desired language has been select, press the MENU/TV button directly before prevent auto tuning will start.

When steps 1 to 3 have been finish, ready to operate the all operating mode.

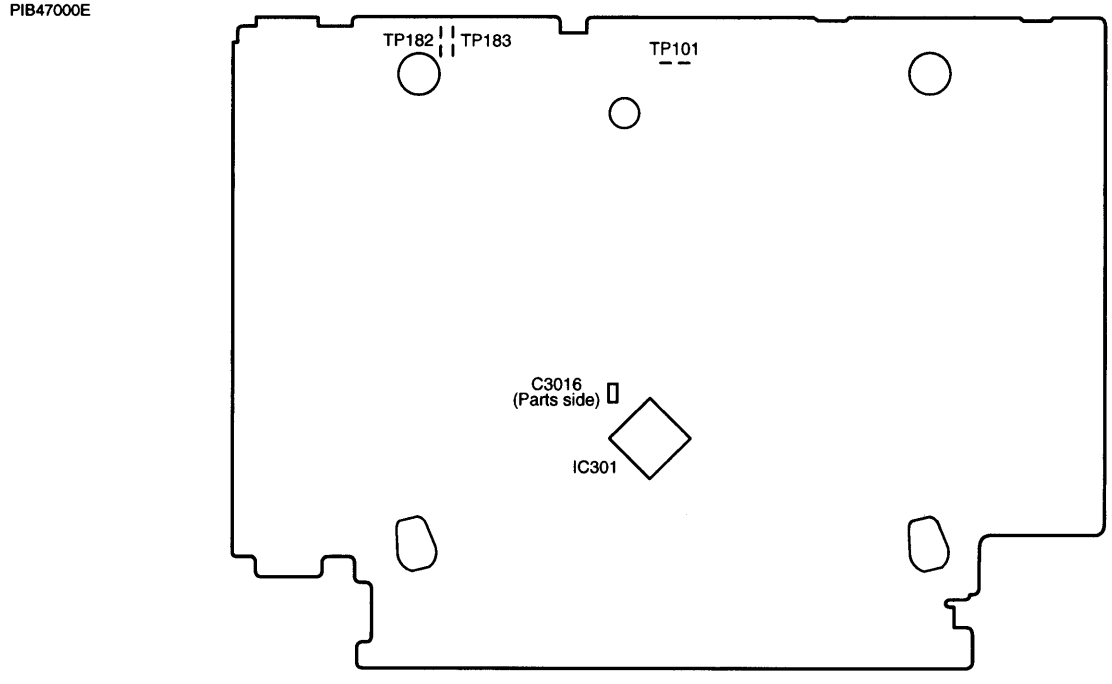
2-1. SERVO CIRCUIT ADJUSTMENT

- These adjustments should be done upon completion of the tape transport adjustments.
- If the tape transport adjustments (except the tilt adjustment) are done after these adjustments, follow the procedures again in section 2-1-3, "Switching position adj."
- When a cassette tape is loaded, auto-tracking will be set immediately after starting the first playback. As this will daviate the tracking center set, be sure to press the channel buttons▲(+) and ▼(–) once directly after starting playback to prevent auto-tracking from being set.

2-1-1. TEST EQUIPMENT AND STANDARDS REQUIRED

Oscilloscope	Vertical sensitivity Bandwidth	: 5 mV/DIV, external trigger : more than 10 MHz
Alignment Tape	VHJ-0009 or VHJ-0023	: SP mode, monoscope, 6 KHz
Blank Tape	VHS-type cassette tape	
Monitor TV		

2-1-2. LOCATION OF ADJUSTMENT POINTS



CP-1 PWB (Foil side)

Fig. 2-1-1

Note:

- Set the REC/PLAY SPEED button to indicator panel in the SP mode.
- Self-recording means "Record any broadcasting or video signal and playback the just-recorded portion."

2-1-3. SWITCHING POSITION ADJ.

Measuring Point	Measuring Equipment	Adj. Condition
TP101 (VIDEO OUT) TP183 (RF SW-P)	Oscilloscope	PLAY (SP) mode Alignment tape VHJ-0009 (PM-S6)

Adj. Location	Adj. Value
REC button CHANNEL ▲(+)/▼(–) button PLAY button	6.5 H ± 0.5 H

1. At playback starts, press the REC button 3 times within 3 seconds after the playback picture comes out. However, these 3-push must be done within 2 seconds, and last push must be kept pressed for 0.5 seconds. (Fig. 2-1-3)
2. "P 0:00" is appeared in FLD, and it becomes the adjustment mode. This indication value changes automatically, and 6.5 H adjustment is done. When this value stops, adjustment value almost becomes 6.5 H.
3. Observe the video output signal by the oscilloscope, triggered by the fall down point of RF SW PULSE (TP183), and confirm that a front edge of V-SYNC is delayed for 6.5 H ± 0.5 H from the fall down point of RF SW PULSE. (Fig. 2-1-4)
4. After the adjustment data is fixed (it should be within 15 seconds from the adjustment mode start), press the PLAY button more than 1 second. Then the indication changes to "P –:–", it writes the data (delay quantity) to the E²PROM. (If it passes through 15 seconds before pushing the PLAY button, the intake of the data isn't done, and it finishes the adjustment mode.)
5. If it is not in 6.5 H ± 0.5 at the time of the confirmation by the above 3., make manual fine adjustment by pressing the CHANNEL button, and do the operation of 4.

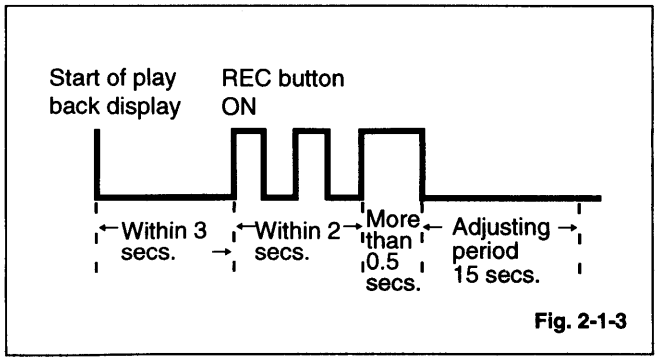


Fig. 2-1-3

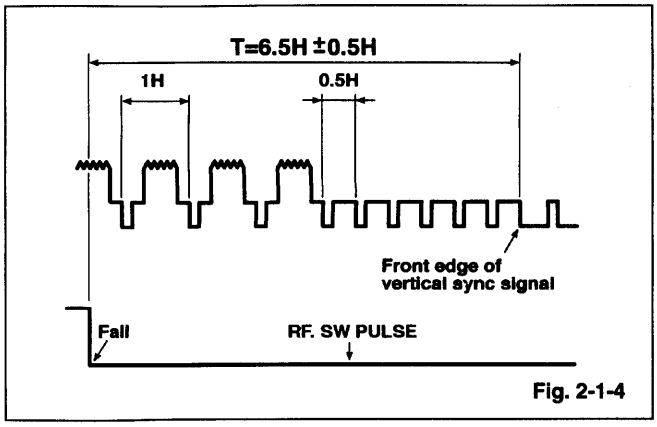


Fig. 2-1-4

2-1-4. SP STILL V-LOCK ADJ.

Measuring Point	Measuring Equipment	Adj. Condition
Picture of monitor	Monoscope pattern	Self-recording (SP mode) STILL mode

Adj. Location	Adj. Value
CHANNEL▲(+) or▼(–) button	The minimum vertical shake

1. Set the REC/PLAY SPEED button to the SP mode.
2. Play back the own recorded portion of the tape and then set the VCR in the STILL mode.
3. Press the CHANNEL▲(+) or▼(–) button so that the vertical shake of picture becomes its minimum.

2-2. IF CIRCUIT ADJUSTMENT

- In this model, the circuits of the TUNER, IF, and RF converter have been made into one. Therefore, should one circuit malfunction, the whole unit must be replaced.
- The adjustments for the IF (RF AGC) circuit of the 3 in 1 tuner are described below.

Note: The 3 in tuner dose not need any adjustments, because precise adjustments were down before shipment.

2-2-1. TEST EQUIPMENT AND STANDARD REQUIRED

Monitor TV	

2-2-2. LOCATION OF ADJUSTMENT POINT

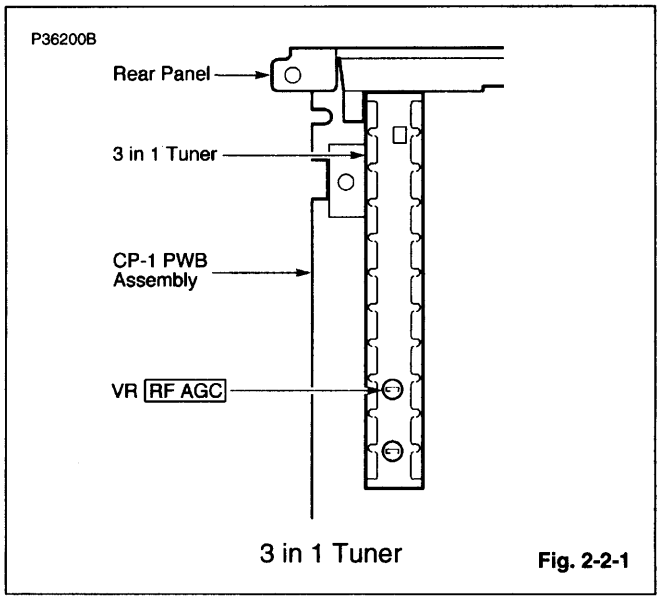


Fig. 2-2-1

2-2-3. RF AGC ADJ.

Measuring Point	Measuring Equipment	Adj. Condition
Picture of monitor TV	Monitor TV	E-E mode

Adj. Location	Adj. Value
VR (RF AGC) (on the 3 in 1 tuner)	S/N is best point

1. Connect the monitor TV to the VHF/UHF antenna output terminal.
2. Connect the VHF or UHF antenna to the VHF/UHF antenna input terminal.
3. Receive the middle electrical field (70 dBμ ~ 90 dBμ) of the VHF or UHF channel, and slowly turn the VR (RF AGC) from the point where snow-noise is present to the point where it just disappears from the monitor TV.
4. Confirm by monitor TV that there is no beat and saturation (S/N is best point) when receiving any TV channel.

2-3. CHECKING THE RF CHANNEL

If the TV and VCR are connected by an aerial output cable which has poor shielding characteristics, turn off the RF converter of the VCR and use the VCR with an AV cable. To turn the RF converter off, input "00" when setting the RF (when "RF" is displayed) during VCR pre-setting.

3. TEST POINTS FOR TAPE PATH ADJUSTMENT

Test points TP182 (ENV) and TP183 (SW-P) for tape path adjustment are shown in figure below.
For adjustment, refer to the separate volume "VC Mechanism Manual" (MM531683).

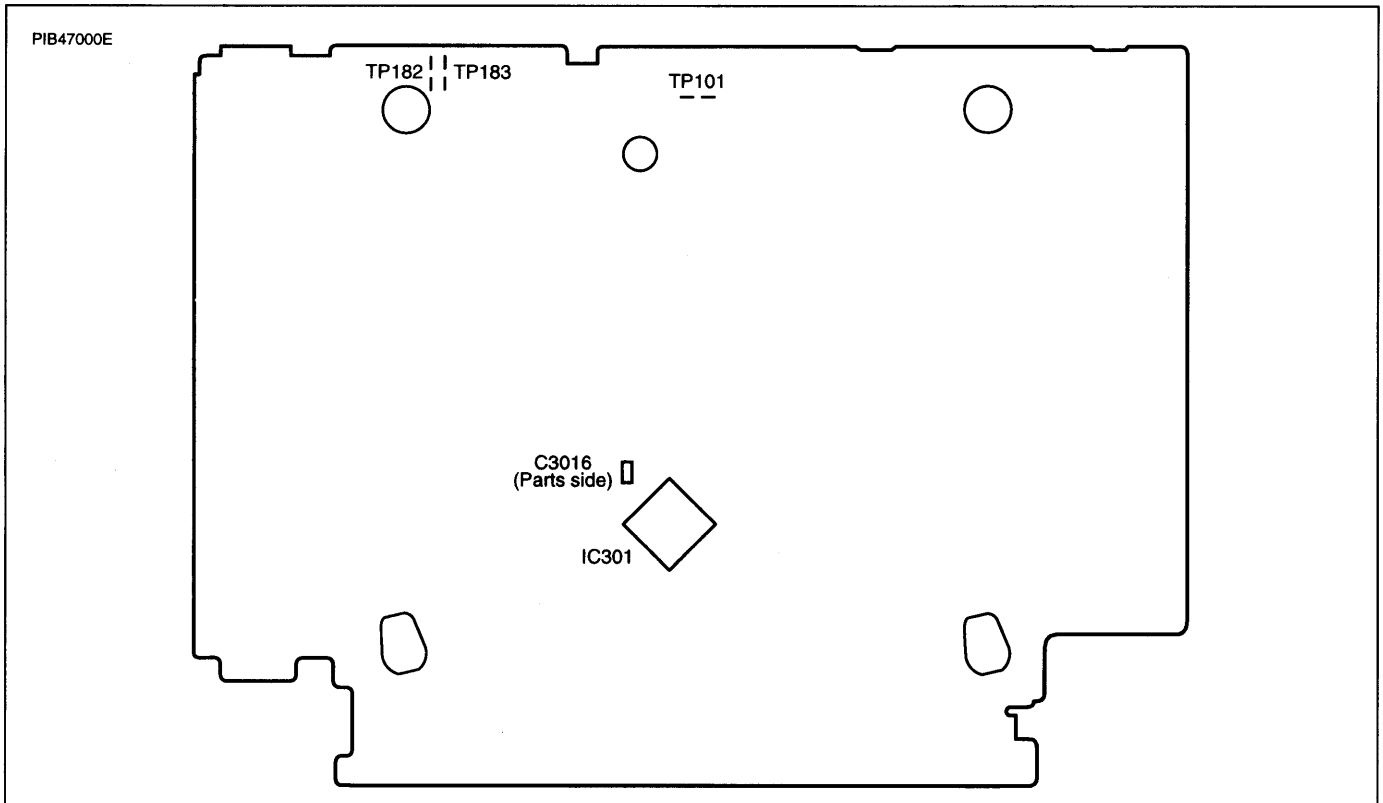
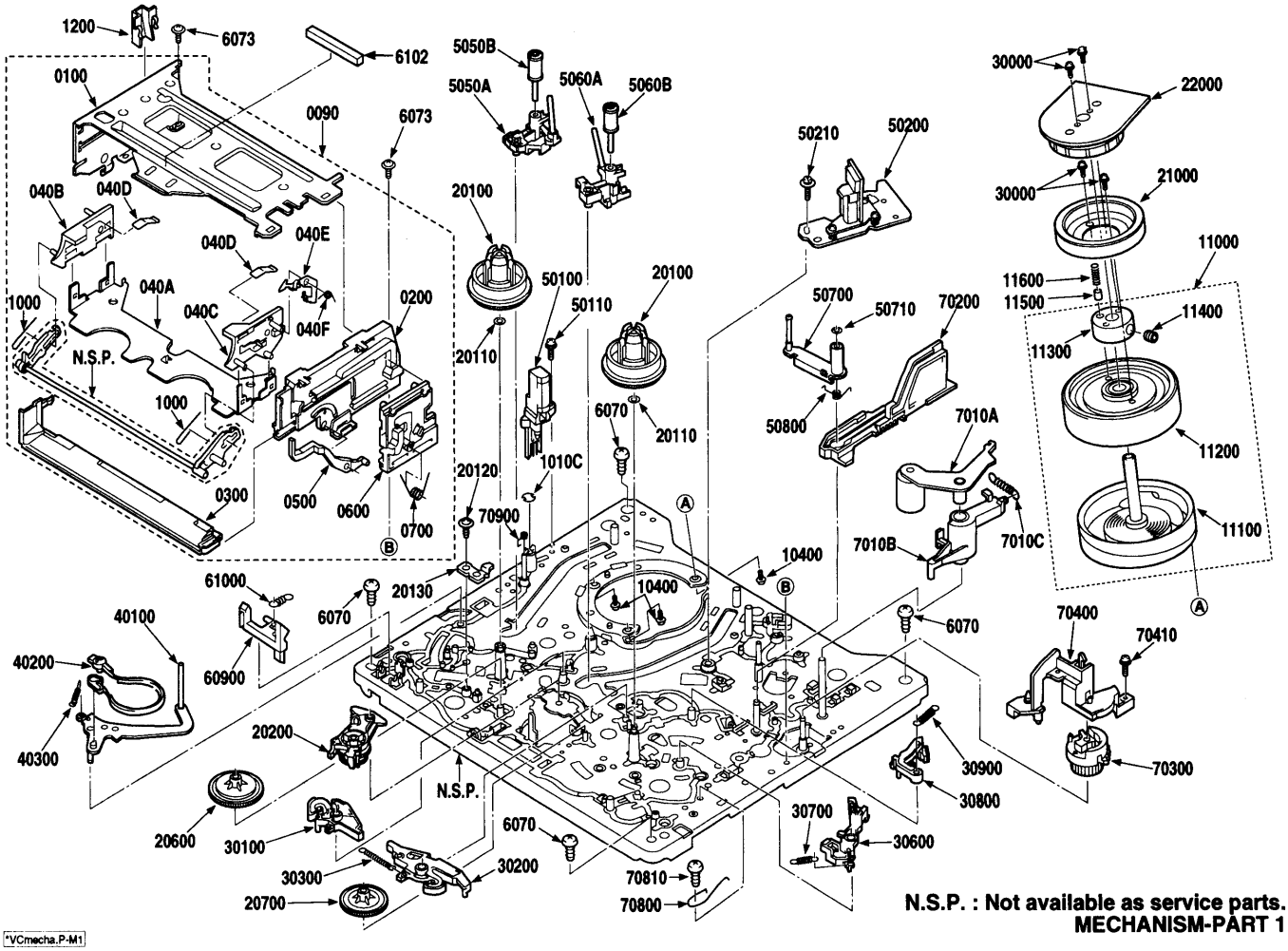


Fig. 3-1

4. PARTS LIST

MECHANISM PARTS

LOCATION	PARTS NO.	DESCRIPTION
MECHANISM PARTS 1		
11000	613 182 7769	COMPL,CYLINDER,4H6P-R3
OR	613 182 7752	COMPL,CYLINDER,4H6P-R3
11100	613 182 7882	ASSY,CYLINDER,LWR 6
OR	613 182 7875	ASSY,CYLINDER,LWR 6
11200	613 182 7790	ASSY,CYLINDER,UPR 4H6P-R3
OR	613 182 7783	ASSY,CYLINDER,UPR 4H6P-R3
11300	613 182 6311	MOUNTING,MOTOR,CYLINDER
11400	411 158 0208	SCR SET HEX-SCT 4X6
11500	613 182 6229	EARTH,CHIP,CYLINDER
11600	613 182 6533	SPRING,EARTH,CYLINDER
21000	645 030 3678	MOTOR,ROTOR,CYL DC 2W VC
22000	645 030 3661	MOTOR,STATOR,CYL DC 2W VC
30000	412 036 5001	SPECIAL SCREW 2.3X6
1200	613 184 6630	HOOD,SENSOR VC
6012	613 151 6618	PAD
6073	411 177 3709	SCR S-TPG CUP 2.6X6
0090	613 182 3624	COMPL,CASSETTE MECHA VC
0100	613 182 3778	STAND,L VC
0200	613 182 3785	STAND,R VC
0300	613 152 0660	FRAME UNDER
040A	613 168 0937	TRAY,VC
040B	613 187 2769	GUIDE,CASSETTE L VC
040C	613 182 3723	GUIDE,CASSETTE R VC
040D	613 182 3815	SPRING,PLATE VC
040E	613 182 3730	LEVER,LID OPENER VC
040F	613 182 3822	SPRING,LID OPENER VC
0500	613 182 3747	LEVER,DOOR OPENER VC
0600	613 182 3808	SLIDE,DRIVE VC
0700	613 182 3839	SPRING,START VC
1000	613 183 8277	SPRING,TRAY VC
6070	411 021 7907	SCR S-TPG BIN 4X12
1010C	613 182 4461	GUIDE,S VC
10400	412 052 6204	SPECIAL SCREW-2.6X5.5
20100	613 182 7035	REEL,SPINDLE VC
20110	412 059 1509	SPECIAL WASHER 3.4X0.3
OR	412 058 0503	SPECIAL WASHER 3.4X0.4
OR	412 059 1608	SPECIAL WASHER 3.4X0.5
20120	412 058 4907	SPECIAL SCREW 2.6X8
20130	613 185 8978	MOUNTING,BT BAND VC
20200	613 186 3804	COMPL,MOUNTING,IDLER VC
20600	613 182 3297	GEAR,REEL S VC
20700	613 182 3303	GEAR,REEL T VC
30100	613 182 4676	ASSY,BRAKE S VC
30200	613 182 4683	ASSY,BRAKE T VC
30300	613 182 6588	SPRING,BRAKE MAIN VC
30600	613 182 4690	ASSY,BRAKE,SOFT T VC
30700	613 182 6595	SPRING,BRAKE SOFT T VC
30800	613 151 8490	ASSY,BRAKE CAPSTAN
30900	613 152 0356	SPRING,BRAKE CAPSTAN
40100	613 151 8759	ASSY,LEVER,BT
40200	613 160 5282	ASSY,BRAKE,BAND
40300	613 152 0271	SPRING,BT
5050A	613 182 3228	ASSY,MOUNTING,INCL S VC
5050B	613 184 4384	ASSY,ROLLER,GUIDE
5060A	613 182 3242	ASSY,MOUNTING,INCL T VC
5060B	613 184 4384	ASSY,ROLLER,GUIDE



N.S.P. : Not available as service parts.

MECHANISM-PART 1

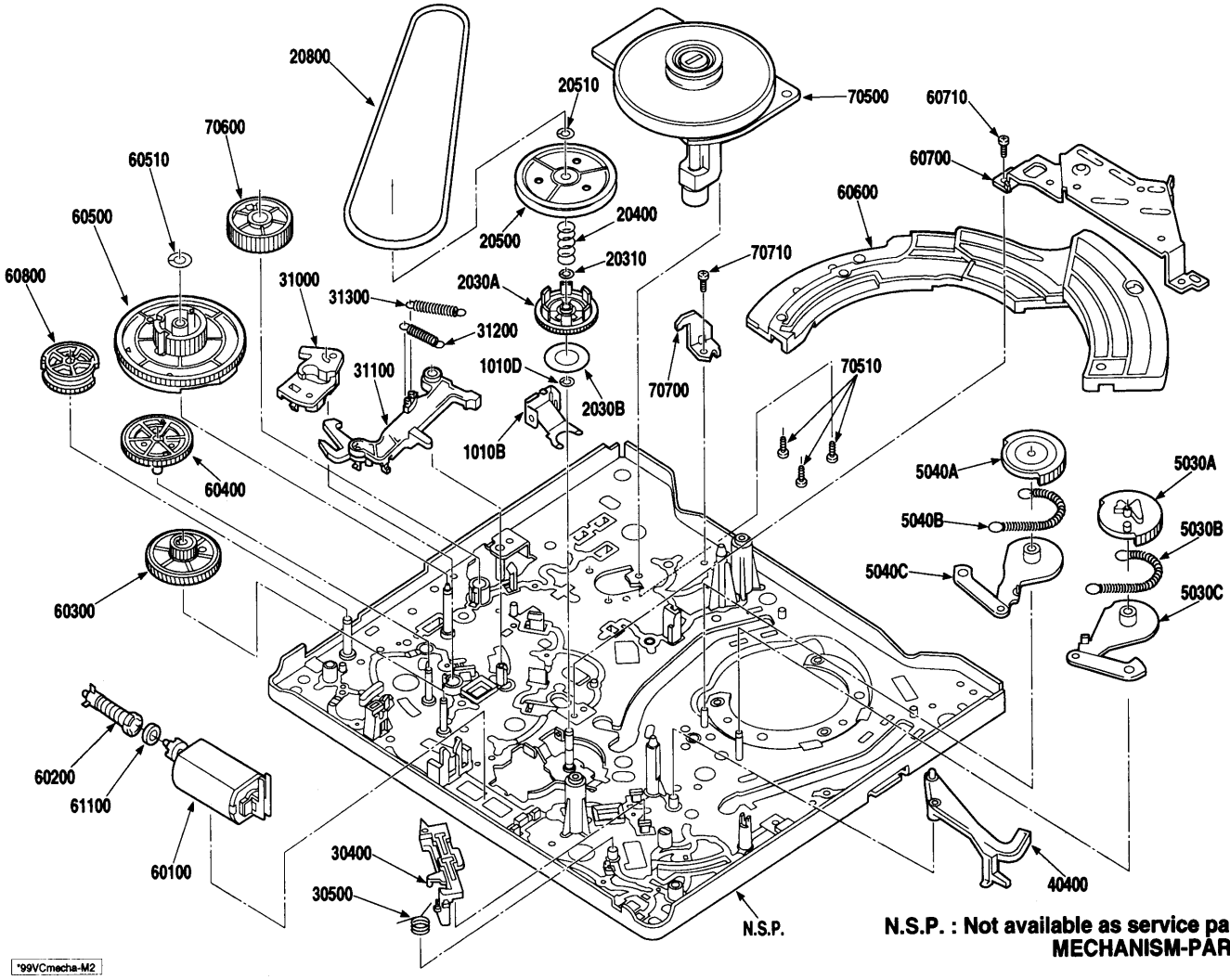
*VCmecha.P-M1

LOCATION	PARTS NO.	DESCRIPTION
50100	645 030 0950	HEAD,ERASE FULL VC
50110	412 049 1700	SPECIAL SCREW-2.6X10
50200	613 184 5916	ASSY,HEAD R/P ACE VC
50210	412 052 3500	SPECIAL SCREW 2.6X12
50700	613 182 5758	ASSY,LEVER LOAD VC
50710	411 109 1902	WASHER Y 3.1X6X0.5
50800	613 182 6540	SPRING,LEVER LOAD VC
60900	613 182 4249	LEVER,EP SW VC
61000	613 182 4256	SPRING,EP SW VC
7010A	613 182 6809	ASSY,LEVER,PINCH VC
7010B	613 182 6328	MOUNTING,LIFT PINCH VC
7010C	613 182 6557	SPRING,PINCH ROLLER VC
70200	613 182 6250	GEAR,RACK PINCH VC
70300	613 182 6243	GEAR,CAM PINCH VC
70400	613 182 6335	MOUNTING,OPENER VC
70410	412 049 1700	SPECIAL SCREW-2.6X10
70800	613 185 7490	SPRING,EARTH VC
70810	412 048 8007	SPECIAL SCREW-2.6X6
70900	613 186 5129	SPRING,GUIDE EARTH VC

MECHANISM PARTS 2

1010B	613 182 3358	LEVER,CLUTCH VC
1010D	411 120 1400	WASHER Y 2.6X4.7X0.25
2030A	613 182 3310	GEAR,CLUTCH VC
2030B	412 058 7908	SPECIAL WASHER 7.3X16X0.5
20310	411 109 4002	WASHER Y 2.6X4.7X0.5
20400	613 182 7042	SPRING,CLUTCH VC
20500	613 182 2986	ASSY,PULLEY,FRICTION VC
20510	412 045 4606	SPECIAL WASHER 2.4X6X0.25

LOCATION	PARTS NO.	DESCRIPTION
20800	613 182 3259	BELT,REEL VC
30400	613 182 6526	SLIDE,SOFT S VC
30500	613 182 6601	SPRING,BRAKE SOFT S VC
31100	613 182 5765	COMPL,LEVER,ACT BRAKE VC
31000	613 182 6298	LEVER,CONTROL BRAKE VC
31200	613 182 6571	SPRING,CHANGE CLUTCH VC
31300	613 182 6564	SPRING,RETURN BRAKE VC
40400	613 153 7583	ASSY,LEVER SPRING BT
5030A	613 152 2763	GEAR,LOAD S
5030B	613 152 0370	SPRING,LOAD S
5030C	613 160 3691	ASSY,LEVER,LOAD S
5040A	613 152 2770	GEAR,LOAD T
5040B	613 152 0363	SPRING,LOAD T
5040C	613 160 3707	ASSY,LEVER,LOAD T
60100	645 029 7014	ASSY,MOTOR LOADING BB VC
60200	613 151 8599	COMPL,GEAR,WORM
60300	613 151 9138	GEAR,WHEEL 1
60400	613 160 3790	GEAR,WHEEL 2
60500	613 182 3273	CAM,MAIN VC
60510	412 054 6806	SPECIAL WASHER 3.6X0.5
60600	613 182 3419	SLIDE,CRESCENT VC
60700	613 182 4485	MOUNTING CRESCENT VC
60710	412 048 8007	SPECIAL SCREW-2.6X6
60800	613 182 6236	GEAR,LOCK VC
61100	613 151 9107	DAMPER
70500	645 030 3388	MOTOR,CAPSTAN DC 3W VC
70510	412 048 7604	SPECIAL SCREW-2.6X6
70600	613 182 3327	GEAR,RELAY PINCH VC
70700	613 167 5926	MOUNTING CAPSTAN
70710	412 048 8007	SPECIAL SCREW-2.6X6



N.S.P. : Not available as service parts.

MECHANISM-PART 2

LOCATION	PARTS NO.	DESCRIPTION

ACCESSORIES

	645 033 1633	REMOCON,INFRARED,WITH COVER BATTERY, VHR-789E ONLY
	645 031 3103	REMOCON,INFRARED,WITH COVER BATTERY, VHR-779E ONLY
	613 179 2531	COVER BATTERY,FOR REMOCON,INFRARED, VHR-779E ONLY
	613 179 2586	COVER BATTERY,FOR REMOCON,INFRARED, VHR-789E ONLY
	613 183 5870	INSTRUCTION MANUAL,VHR-779E ONLY
	613 185 0903	INSTRUCTION MANUAL,VHR-789E ONLY
	645 023 4170	CABLE,ANT PAL
OR	645 025 1382	CABLE,ANT PAL
	⚠645 019 1923	CORD,POWER-1.8MK
OR	⚠645 023 4156	CORD,POWER-1.5MK
OR	⚠613 136 6411	CORD,POWER

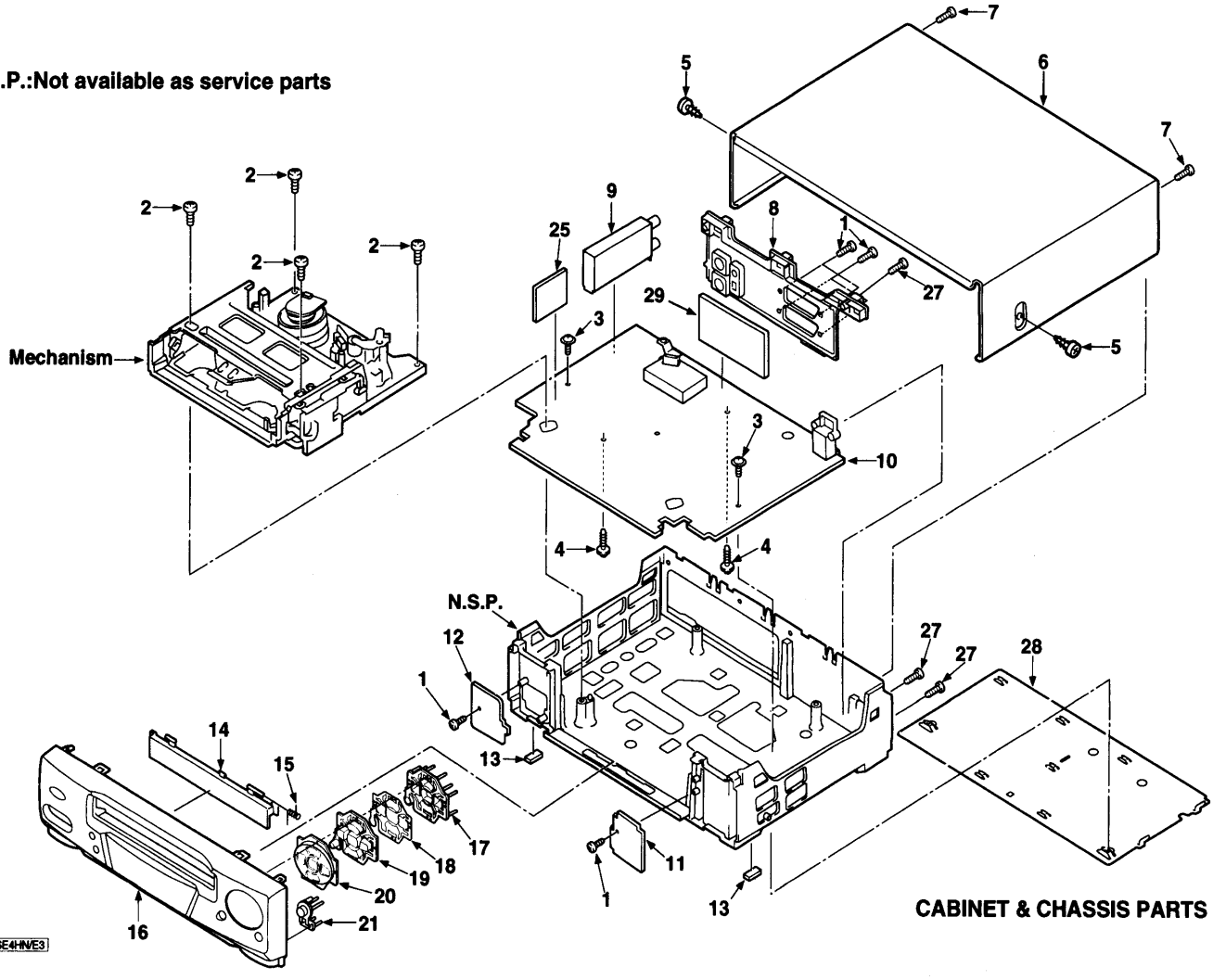
PACKING MATERIALS

	613 185 0569	CARTON CASE,VHR-789E ONLY
	613 183 5849	CARTON CASE,VHR-779E ONLY
	613 183 5856	CUSHION, FRONT(SID)
	613 183 5863	CUSHION, BACK(SID)
	613 139 8047	POLYE COVER,INNER-K

CABINET & CHASSIS PARTS

1	411 137 0007	SCR L-TPG BIN 3X10
2	411 021 7907	SCR S-TPG BIN 4X12
3	411 142 9200	SCR S-TPG PAN+FLG 3X10
4	412 052 5108	SPECIAL SCREW-2.6X12
5	412 028 9406	SPECIAL SCREW
6	613 185 4826	COVER TOP,VHR-779E ONLY
6	613 185 4833	COVER TOP,VHR-779E ONLY
6	613 184 3585	COVER TOP,VHR-789E ONLY
7	411 025 5404	SCR S-TPG BIN 3X12
8	613 184 8238	TERMINAL,VHR-789E ONLY
8	613 183 5047	TERMINAL,VHR-779E ONLY
9	645 031 0850	TUNER,RF/TU/IF
10	613 183 6518	COMPL PWB,CP-1-A,VHR-779E ONLY
10	613 185 0767	COMPL PWB,CP-1-A,VHR-789E ONLY
11	613 184 7767	COMPL PWB,TM-1,VHR-789E ONLY
12	613 184 4797	COMPL PWB,TM-2,VHR-789E ONLY
13	613 121 1001	STAND,FELT,(FRONT)
14	613 183 8673	DOOR CASSETTE,VHR-789E ONLY
14	613 186 4306	DOOR CASSETTE,VHR-779E ONLY
15	613 183 9700	SPRING,VHR-789E ONLY
15	613 153 0478	SPRING,VHR-779E ONLY
16	613 185 1047	ASSY,CABINET FRONT SID,VHR-789E ONLY
16	613 183 7508	ASSY,CABINET FRONT SID,VHR-779E ONLY
17	613 183 8789	HOLDER 6P,VHR-789E ONLY
18	613 183 8758	DEC,SHEET,VHR-789E ONLY
19	613 183 8536	BUTTON,6P,VHR-789E ONLY
20	613 184 2274	DEC,BUTTON,VHR-789E ONLY
21	613 186 3347	BUTTON,VHR-789E ONLY
25	613 181 8224	COMPL PWB,TN-6
27	411 025 5404	SCR S-TPG BIN 3X12
28	613 183 7898	COVER BOTTOM
29	613 184 9259	COMPL PWB,TB-1,VHR-789E ONLY
29	613 183 6204	COMPL PWB,TB-1,VHR-779E ONLY

N.S.P.:Not available as service parts



ELECTRICAL PARTS

Note:

1. Materials of Capacitors and Resistors are abbreviated as follows ;

Resistors		Capacitors	
MT-FILM	Metallized Film Resistor	MT-POLYEST	Metallized Polyester Capacitor
MT-GLAZE	Metallized Glaze Resistor	MT-COMPO	Metallized Composite Capacitor
OXIDE-MT	Oxide Metallized Film Resistor	TA-SOLD	Tantalum Solid Capacitor
		AL-SOLID	Aluminum Solid Capacitor
		NP-ELECT	Non-Polarized Electrolytic Capacitor
		OS-SOLID	Aluminum Solid Capacitors with Organic Semiconductive Electrolytic Capacitor
		DL-ELECT	Double Layered Electrolytic Capacitor

2. Tolerance of Capacitor (10pF over) and Resistor are noted with follow symboles.
   F .....1% G .....2% J .....5% K 10%
   M .....20% N .....30% Z .....+80% ~ -20%
3. Capacitors
   U : μF P : pF
4. Inductors
   UH : μH MH : mH
5. N.S.P. : Not available as service parts.

COMPL PWB,CP-1-A

LOCATION	PARTS NO.	DESCRIPTION
	613 183 6518	VHR-779E ONLY
	613 185 0767	VHR-789E ONLY
	(CONNECTORS)	
CN181	645 030 7393	SOCKET,FFC 10P (N.S.P)
CN233	645 029 8011	SOCKET,2P (N.S.P)
CN351	645 009 4095	SOCKET,FFC 5P (N.S.P)
CN352	645 008 1842	PLUG,8P (N.S.P)
CN501	⚠645 028 4885	SOCKET,INLET AC
OR	⚠645 000 5411	SOCKET,INLET AC
CN701	645 009 4194	SOCKET,FFC 15P (N.S.P),VHR-789E ONLY
OR	645 005 4235	SOCKET,15P (N.S.P),VHR-789E ONLY
CN801	645 029 8011	SOCKET,2P (N.S.P)
	(SEMICONDUCTORS)	
Q1001	405 014 4509	TR 2SC2412K-R
OR	405 014 4608	TR 2SC2412K-S
Q1002	405 035 6100	TR 2SC2413K-Q
Q1003	405 014 4509	TR 2SC2412K-R
OR	405 014 4608	TR 2SC2412K-S
Q1004	405 002 0308	TR 2SA1037K-R
OR	405 002 0407	TR 2SA1037K-S
Q1005	405 014 4509	TR 2SC2412K-R
OR	405 014 4608	TR 2SC2412K-S
Q1006	405 014 4509	TR 2SC2412K-R
OR	405 014 4608	TR 2SC2412K-S
Q1007	405 014 4509	TR 2SC2412K-R
OR	405 014 4608	TR 2SC2412K-S
Q1008	405 002 0308	TR 2SA1037K-R
OR	405 002 0407	TR 2SA1037K-S
Q1009	405 014 4509	TR 2SC2412K-R
OR	405 014 4608	TR 2SC2412K-S
Q1010	405 002 0308	TR 2SA1037K-R
OR	405 002 0407	TR 2SA1037K-S
Q1011	405 000 2908	TR DTC114EK
Q1012	405 002 0407	TR 2SA1037K-S
OR	405 002 0308	TR 2SA1037K-R
Q1013	405 035 6100	TR 2SC2413K-Q
Q1401	405 002 0308	TR 2SA1037K-R
OR	405 002 0407	TR 2SA1037K-S
Q2001	405 003 5609	TR 2SA1318-S
OR	405 003 5708	TR 2SA1318-T
OR	405 003 5807	TR 2SA1318-U
Q2002	405 025 0200	TR 2SD734-G
OR	405 024 9907	TR 2SD734-F
Q2003	405 018 0002	TR 2SC3331-S
OR	405 018 0101	TR 2SC3331-T
OR	405 018 0200	TR 2SC3331-U
Q2004	405 018 0002	TR 2SC3331-S
OR	405 018 0101	TR 2SC3331-T
OR	405 018 0200	TR 2SC3331-U
Q2005	405 003 5609	TR 2SA1318-S
Q2005	405 003 5708	TR 2SA1318-T
OR	405 003 5807	TR 2SA1318-U
Q2301	405 083 5209	TR DTC343TK
Q2302	405 083 5209	TR DTC343TK
Q2303	405 000 2007	TR DTA144EK
Q2304	405 000 2007	TR DTA144EK
Q2305	405 029 3504	TR DTC144EK
Q2371	405 083 5209	TR DTC343TK
Q2372	405 000 2007	TR DTA144EK
Q3007	405 015 8407	TR 2SC2812-L5
OR	405 015 8704	TR 2SC2812-L6
OR	405 014 4509	TR 2SC2412K-R
OR	405 014 4608	TR 2SC2412K-S
Q3008	405 014 4509	TR 2SC2412K-R
OR	405 015 8704	TR 2SC2812-L6
OR	405 014 4608	TR 2SC2412K-S
OR	405 015 8407	TR 2SC2812-L5
Q3009	405 002 6706	TR 2SA1179-M6
OR	405 002 0308	TR 2SA1037K-R
OR	405 002 0407	TR 2SA1037K-S
OR	405 002 6508	TR 2SA1179-M5
Q3010	405 002 6508	TR 2SA1179-M5
OR	405 002 6706	TR 2SA1179-M6
OR	405 002 0308	TR 2SA1037K-R
OR	405 002 0407	TR 2SA1037K-S
Q3061	405 002 6508	TR 2SA1179-M5
OR	405 002 6706	TR 2SA1179-M6
OR	405 002 0308	TR 2SA1037K-R
OR	405 002 0407	TR 2SA1037K-S
Q3062	405 002 6508	TR 2SA1179-M5
OR	405 002 6706	TR 2SA1179-M6
OR	405 002 0308	TR 2SA1037K-R
OR	405 002 0407	TR 2SA1037K-S
Q3065	405 014 4509	TR 2SC2412K-R
OR	405 014 4608	TR 2SC2412K-S
Q3301	405 000 5305	TR DTC143TK
Q3302	405 000 2007	TR DTA144EK
Q5002	405 089 2202	TR 2SC4483-T
Q5101	405 125 3200	TR 2SC5070
Q5102	405 089 2202	TR 2SC4483-T
OR	405 104 3108	TR 2SD1858-Q
OR	405 029 4501	TR 2SD1858-R
OR	405 089 2103	TR 2SC4483-S
Q5103	405 013 6801	TR 2SC2274-E
OR	405 013 7006	TR 2SC2274-F
OR	405 013 7204	TR 2SC2274K-E
OR	405 013 7303	TR 2SC2274K-F
Q5104	405 089 2103	TR 2SC4483-S
OR	405 089 2202	TR 2SC4483-T
OR	405 104 3108	TR 2SD1858-Q
OR	405 029 4501	TR 2SD1858-R
Q5110	405 083 6305	TR DTB113ZK
Q5111	405 083 6305	TR DTB113ZK
Q5112	405 000 4100	TR DTC124EK
Q5113	405 000 2908	TR DTC114EK
Q5114	405 125 3200	TR 2SC5070
Q5115	405 029 3504	TR DTC144EK
Q5116	405 000 4100	TR DTC124EK

LOCATION	PARTS NO.	DESCRIPTION
Q5117	405 083 6305	TR DTB113ZK
Q5120	405 013 6801	TR 2SC2274-E
OR	405 013 7006	TR 2SC2274-F
Q5120	405 013 7204	TR 2SC2274K-E
OR	405 013 7303	TR 2SC2274K-F
	(INTEGRATED CIRCUITS)	
IC101	409 435 1406	IC LA71590M-MPB
IC141	410 324 1605	IC LC74793JM-MPB
IC231	409 443 9302	IC AN3650NFBP
IC301	410 338 8409	IC MN101D02EBE
IC302	409 440 4508	IC LB1643L
IC304	410 189 5800	IC 24LC04B/P
OR	410 172 6906	IC X24C04PC7346
OR	410 177 3702	IC AT24C04-10PC
OR	409 348 6901	IC XL24C04P
IC305	409 415 0009	IC BMR03H-04
IC501	409 409 3801	IC MA3810-4105
IC511	409 180 2307	IC UPC1093J
OR	409 067 7203	IC L5431
IC512	409 391 6200	IC PQ09RD11
IC701	409 424 6900	IC MN12510F
	(DIODES)	
D1001	407 012 4406	DIODE 1SS133
D1005	407 012 4406	DIODE 1SS133
D1006	407 012 4406	DIODE 1SS133
D1007	407 012 4406	DIODE 1SS133,VHR-789E ONLY
D1008	407 012 4406	DIODE 1SS133,VHR-789E ONLY
D1009	407 012 4406	DIODE 1SS133
D1010	407 012 4406	DIODE 1SS133
D1011	407 012 4406	DIODE 1SS133
D2301	407 012 4406	DIODE 1SS133
D3001	407 007 9904	DIODE GMA01
OR	407 012 4406	DIODE 1SS133
D3002	407 007 9904	DIODE GMA01
OR	407 012 4406	DIODE 1SS133
D3401	407 100 0006	ZENER DIODE MTZJ33C
D3501	407 012 4406	DIODE 1SS133
OR	407 007 9904	DIODE GMA01
D3502	407 007 9904	DIODE GMA01
OR	407 012 4406	DIODE 1SS133
D5001	407 104 5304	DIODE S1WB(A)60
OR	407 197 6509	DIODE DB155G-S
D5002	407 004 9808	DIODE DSK10E
D5011	407 100 6909	DIODE AG01
OR	407 198 2401	DIODE SFT14
OR	407 091 6902	DIODE ERA38-04
D5012	407 100 6909	DIODE AG01
OR	407 091 6902	DIODE ERA38-04
OR	407 198 2401	DIODE SFT14
D5013	⚠ 407 169 5608	PHOTO COUPLE PC123U2
D5014	407 078 2705	DIODE 1SS244
D5015	407 078 2705	DIODE 1SS244
D5016	407 099 5402	ZENER DIODE MTZJ6.2B
D5019	407 078 2705	DIODE 1SS244
D5101	408 038 5309	DIODE ERC81-004J11
D5102	407 205 7009	DIODE D2FS6
OR	407 205 7009	DIODE D2FS6
D5103	407 078 2705	DIODE 1SS244
D5104	407 198 2401	DIODE SFT14
OR	407 100 6909	DIODE AG01
OR	407 091 6902	DIODE ERA38-04
D5105	407 167 8007	DIODE D1FL20U
OR	407 167 8007	DIODE D1FL20U
D5107	407 099 5303	ZENER DIODE MTZJ5.6B
D5108	407 099 5303	ZENER DIODE MTZJ5.6B
D5109	407 099 5303	ZENER DIODE MTZJ5.6B
D5110	407 099 6508	ZENER DIODE MTZJ12A
D5111	407 099 5600	ZENER DIODE MTZJ6.8A
D5112	407 091 6902	DIODE ERA38-04
D5115	407 078 2705	DIODE 1SS244
D5116	407 055 4708	ZENER DIODE RD24MB1
OR	407 055 4807	ZENER DIODE RD24M-B2
OR	407 120 7108	ZENER DIODE RD24MB3
D5118	407 150 7703	DIODE RB441Q
D5119	407 150 7703	DIODE RB441Q
D5120	407 150 7703	DIODE RB441Q
D5125	407 099 5402	ZENER DIODE MTZJ6.2B
D7001	407 007 9904	DIODE GMA01

LOCATION	PARTS NO.	DESCRIPTION
D7001	407 012 4406	DIODE 1SS133
D7002	407 007 9904	DIODE GMA01,VHR-789E ONLY
OR	407 012 4406	DIODE 1SS133,VHR-789E ONLY
D7004	407 012 4406	DIODE 1SS133
OR	407 007 9904	DIODE GMA01
D7005	407 007 9904	DIODE GMA01
OR	407 012 4406	DIODE 1SS133
D7009	407 007 9904	DIODE GMA01
OR	407 012 4406	DIODE 1SS133
D7011	407 007 9904	DIODE GMA01
OR	407 012 4406	DIODE 1SS133
D7014	407 007 9904	DIODE GMA01,VHR-789E ONLY
OR	407 012 4406	DIODE 1SS133,VHR-789E ONLY
D7016	407 007 9904	DIODE GMA01
OR	407 012 4406	DIODE 1SS133
D7017	407 007 9904	DIODE GMA01
OR	407 012 4406	DIODE 1SS133
D7018	407 007 9904	DIODE GMA01
OR	407 012 4406	DIODE 1SS133
D7019	407 007 9904	DIODE GMA01
OR	407 012 4406	DIODE 1SS133
D7021	407 012 4406	DIODE 1SS133
OR	407 007 9904	DIODE GMA01
D7029	408 039 9306	LED SLZ-381B-30H-AB,VHR-779E ONLY
OR	408 040 6103	LED SEL2410GLF44-C,VHR-779E ONLY
OR	408 040 6202	LED SEL2401GLF44-D,VHR-779E ONLY
D8001	407 208 6603	PHOTO,DIODE PN205LT.SN
D8002	407 208 6603	PHOTO,DIODE PN205LT.SN
D8003	407 207 0107	LED LN59LT.SL
	(CRYSTAL DEVICES)	
X1002	645 000 6012	OSC,CRYSTAL 4.433619MHZ
OR	645 000 6029	OSC,CRYSTAL 4.433619MHZ
OR	645 002 4436	OSC,CRYSTAL 4.433619MHZ
OR	645 014 8378	OSC,CRYSTAL 4.433619MHZ
X3001	613 109 0972	OSC,CRYSTAL 32KHZ
X3002	645 008 7899	OSC,CRYSTAL 14.31818MHZ
X7001	645 006 3435	OSC,CERAMIC 4.000MHZ
OR	613 124 2142	RESONATOR,CERAMIC 4MHZ
	(INDUCTORS)	
L1002	645 003 8228	INDUCTOR,68U J
OR	645 002 1510	INDUCTOR,68U J
L1003	645 001 4611	INDUCTOR,120U J
OR	645 003 7948	INDUCTOR,120U J
L1004	645 006 3886	INDUCTOR,1U K
L1005	645 003 7634	INDUCTOR,100U J
OR	645 003 6934	INDUCTOR,100U J
L1006	645 025 0644	INDUCTOR,0.75UH
L2004	645 003 6934	INDUCTOR,100U J
OR	645 003 7634	INDUCTOR,100U J
L2373	645 003 6934	INDUCTOR,100U J
OR	645 003 7634	INDUCTOR,100U J
L2901	645 003 6910	INDUCTOR,10U J
OR	645 003 7627	INDUCTOR,10U J
L3010	645 009 3791	CORE,BEAD
L3061	645 006 3602	INDUCTOR,1.1UH
L3062	645 025 0644	INDUCTOR,0.75UH
L3064	645 025 0644	INDUCTOR,0.75UH
L3065	645 025 0644	INDUCTOR,0.75UH
L3301	645 003 6910	INDUCTOR,10U J
OR	645 003 7627	INDUCTOR,10U J
L3307	645 003 7108	INDUCTOR,33U J
OR	645 003 7733	INDUCTOR,33U J
L5001	⚠ 645 013 5620	LINE FILTER
OR	645 011 6957	INDUCTOR,10U
OR	645 002 4122	INDUCTOR,10U K
L5102	645 011 6957	INDUCTOR,10U
OR	645 002 4122	INDUCTOR,10U K
	(TRANSFORMERS)	
T2001	645 018 3515	TRANS,OSC,70KHZ
T5001	⚠ 645 027 3599	TRANS,POWER,PULSE
	(CAPACITORS)	
C1001	403 192 5905	CERAMIC 0.1U K 25V
C1002	403 130 3109	CERAMIC 0.047U K 50V
C1003	403 109 6308	ELECT 1U M 50V
C1004	403 135 4002	ELECT 47U M 6.3V
C1005	403 068 0409	CERAMIC 0.1U Z 25V
C1006	403 069 5601	CERAMIC 0.01U K 50V
C1007	403 020 0409	CERAMIC 27P J 50V

LOCATION	PARTS NO.	DESCRIPTION
C1008	403 024 7107	CERAMIC 390P J 50V
C1009	403 147 2904	CERAMIC 4.7P C 50V
C1010	403 191 8709	ELECT 1U M 50V
C1011	403 014 9203	CERAMIC 180P J 50V
C1012	403 022 8205	CERAMIC 33P J 50V
C1013	403 139 1502	ELECT 10U M 16V
C1014	403 139 1700	ELECT 33U M 16V
C1015	403 192 5905	CERAMIC 0.1U K 25V
C1016	403 139 2608	ELECT 0.47U M 50V
C1017	403 069 5601	CERAMIC 0.01U K 50V
C1018	403 192 5905	CERAMIC 0.1U K 25V,VHR-789E ONLY
C1019	403 192 5905	CERAMIC 0.1U K 25V
C1020	403 192 5905	CERAMIC 0.1U K 25V
C1022	403 139 2707	ELECT 1U M 50V
C1023	403 139 1502	ELECT 10U M 16V
C1024	403 139 2707	ELECT 1U M 50V
C1025	403 069 5601	CERAMIC 0.01U K 50V
C1026	403 069 5601	CERAMIC 0.01U K 50V
C1027	403 069 5601	CERAMIC 0.01U K 50V
C1028	403 069 5601	CERAMIC 0.01U K 50V
C1029	403 068 0409	CERAMIC 0.1U Z 25V
C1030	403 139 1007	ELECT 47U M 6.3V
C1031	403 069 5601	CERAMIC 0.01U K 50V
C1032	403 139 2707	ELECT 1U M 50V
C1033	403 069 5601	CERAMIC 0.01U K 50V
C1034	403 139 2707	ELECT 1U M 50V
C1035	403 072 1607	CERAMIC 0.022U K 50V
C1036	403 139 1007	ELECT 47U M 6.3V
C1037	403 068 0409	CERAMIC 0.1U Z 25V
C1038	403 139 2707	ELECT 1U M 50V
C1039	403 072 1607	CERAMIC 0.022U K 50V
C1041	403 130 3109	CERAMIC 0.047U K 50V
C1042	403 072 1607	CERAMIC 0.022U K 50V
C1047	403 014 3409	CERAMIC 18P J 50V
C1048	403 013 3004	CERAMIC 150P J 50V
C1049	403 121 9509	CERAMIC 0.1U Z 50V
C1050	403 026 2803	CERAMIC 47P J 50V
C1051	403 026 2803	CERAMIC 47P J 50V
C1052	403 026 2803	CERAMIC 47P J 50V,VHR-789E ONLY
C1053	403 135 4101	ELECT 470U M 6.3V
C1055	403 069 5601	CERAMIC 0.01U K 50V
C1059	403 130 3109	CERAMIC 0.047U K 50V
C1060	403 068 0409	CERAMIC 0.1U Z 25V
C1062	403 068 0409	CERAMIC 0.1U Z 25V
C1403	403 191 8709	ELECT 1U M 50V
C1404	403 069 9500	CERAMIC 0.01U Z 50V
C1405	403 163 7907	ELECT 47U M 6.3V
C1412	403 191 8709	ELECT 1U M 50V
C1414	403 069 5601	CERAMIC 0.01U K 50V
C1415	403 167 7002	ELECT 4.7U M 50V
C1416	403 215 2508	CERAMIC 0.056U K 50V
C1802	403 163 7907	ELECT 47U M 6.3V
C1803	403 068 0409	CERAMIC 0.1U Z 25V
C1804	403 191 8709	ELECT 1U M 50V
C1805	403 069 5601	CERAMIC 0.01U K 50V
C1806	403 069 5601	CERAMIC 0.01U K 50V
C1807	403 069 5601	CERAMIC 0.01U K 50V
C1808	403 022 8205	CERAMIC 33P J 50V
C1809	403 022 8205	CERAMIC 33P J 50V
C1810	403 022 8205	CERAMIC 33P J 50V
C1811	403 022 8205	CERAMIC 33P J 50V
C2001	403 068 0409	CERAMIC 0.1U Z 25V
C2002	403 135 4002	ELECT 47U M 6.3V
C2003	403 068 0409	CERAMIC 0.1U Z 25V
C2004	403 135 3708	ELECT 33U M 6.3V
C2006	403 135 3708	ELECT 33U M 6.3V
C2008	403 074 7607	CERAMIC 5600P K 50V
C2009	403 121 3507	ELECT 4.7U M 50V
C2010	403 068 0409	CERAMIC 0.1U Z 25V
C2011	403 135 4002	ELECT 47U M 6.3V
C2012	403 081 3302	POLYPRO 0.022U J 100V
C2013	403 069 5601	CERAMIC 0.01U K 50V
C2014	403 073 1200	CERAMIC 0.033U K 50V
C2015	403 163 7907	ELECT 47U M 6.3V
C2016	403 109 6308	ELECT 1U M 50V
C2017	403 070 8806	CERAMIC 1500P K 50V
C2019	403 069 1702	CERAMIC 1000P K 50V
C2020	403 069 5601	CERAMIC 0.01U K 50V

LOCATION	PARTS NO.	DESCRIPTION
C2021	403 189 2405	ELECT 10U M 16V
C2022	403 167 7002	ELECT 4.7U M 50V
C2023	403 069 1702	CERAMIC 1000P K 50V
C2301	403 107 9905	ELECT 10U M 16V
C2302	403 150 6500	ELECT 22U M 16V
C2303	403 121 3507	ELECT 4.7U M 50V
C2304	403 121 3507	ELECT 4.7U M 50V
C2305	403 134 5901	ELECT 33U M 16V
C2306	403 189 2405	ELECT 10U M 16V
C2307	403 189 2405	ELECT 10U M 16V
C2308	403 107 9905	ELECT 10U M 16V
C2309	403 107 9905	ELECT 10U M 16V
C2310	403 134 5901	ELECT 33U M 16V
C2311	403 107 9905	ELECT 10U M 16V
C2312	403 135 4002	ELECT 47U M 6.3V
C2313	403 107 9905	ELECT 10U M 16V
C2314	403 107 9905	ELECT 10U M 16V
C2316	403 134 9602	ELECT 47U M 16V
C2318	403 107 9905	ELECT 10U M 16V
C2320	403 121 2401	ELECT 22U M 16V
C2322	403 107 9905	ELECT 10U M 16V
C2323	403 130 3109	CERAMIC 0.047U K 50V
C2324	403 070 9803	CERAMIC 0.015U K 50V
C2327	403 130 3109	CERAMIC 0.047U K 50V
C2328	403 070 9803	CERAMIC 0.015U K 50V
C2351	403 068 0409	CERAMIC 0.1U Z 25V
C2353	403 001 1906	CERAMIC 0.01U M 16V
C2355	403 068 0409	CERAMIC 0.1U Z 25V
C2357	403 192 5905	CERAMIC 0.1U K 25V
C2361	403 069 1702	CERAMIC 1000P K 50V,VHR-789E ONLY
C2362	403 069 1702	CERAMIC 1000P K 50V,VHR-789E ONLY
C2363	403 109 6308	ELECT 1U M 50V
C2372	403 071 8102	CERAMIC 2200P K 50V
C2373	403 107 9905	ELECT 10U M 16V
C2901	403 193 7601	ELECT 220U M 6.3V
C2921	403 192 5905	CERAMIC 0.1U K 25V
C2922	403 069 5601	CERAMIC 0.01U K 50V
C2923	403 069 5601	CERAMIC 0.01U K 50V
C2924	403 068 0409	CERAMIC 0.1U Z 25V
C2925	403 192 5905	CERAMIC 0.1U K 25V
C2926	403 069 5601	CERAMIC 0.01U K 50V
C2929	403 269 5906	CERAMIC 0.22U K 16V
C2930	403 070 9803	CERAMIC 0.015U K 50V
C3001	403 008 7505	CERAMIC 10P D 50V
C3002	403 008 7505	CERAMIC 10P D 50V
C3003	403 018 0503	CERAMIC 22P J 50V
C3004	403 014 3409	CERAMIC 18P J 50V
C3005	403 069 5601	CERAMIC 0.01U K 50V
C3006	403 069 5601	CERAMIC 0.01U K 50V
C3008	403 189 2405	ELECT 10U M 16V
C3011	403 069 5601	CERAMIC 0.01U K 50V
C3013	403 069 5601	CERAMIC 0.01U K 50V
C3014	403 069 5601	CERAMIC 0.01U K 50V
C3015	403 135 3807	ELECT 330U M 6.3V
C3016	403 069 5601	CERAMIC 0.01U K 50V
C3017	403 333 1001	DL-ELECT 0.1F Z 5.5V
C3018	403 163 8409	ELECT 47U M 16V
C3019	403 010 1102	CERAMIC 1000P J 50V
C3020	403 001 1906	CERAMIC 0.01U M 16V
C3025	403 028 4102	CERAMIC 56P J 50V
C3026	403 028 4102	CERAMIC 56P J 50V
C3027	403 068 0409	CERAMIC 0.1U Z 25V
C3037	403 069 5601	CERAMIC 0.01U K 50V
C3040	403 191 8808	ELECT 2.2U M 50V
C3041	403 068 0409	CERAMIC 0.1U Z 25V
C3042	403 107 9905	ELECT 10U M 16V
C3043	403 010 1102	CERAMIC 1000P J 50V
C3044	403 139 1502	ELECT 10U M 16V
C3045	403 010 1102	CERAMIC 1000P J 50V
C3059	403 069 5601	CERAMIC 0.01U K 50V
C3061	403 068 0409	CERAMIC 0.1U Z 25V
C3064	403 086 2805	NP-ELECT 1U M 50V
C3065	403 139 1502	ELECT 10U M 16V
C3066	403 193 7809	ELECT 100U M 16V
C3067	403 068 0409	CERAMIC 0.1U Z 25V
C3068	403 010 1102	CERAMIC 1000P J 50V
C3085	403 068 8801	CERAMIC 100P J 50V
C3301	403 107 9905	ELECT 10U M 16V

LOCATION	PARTS NO.	DESCRIPTION
C3302	403 134 8100	ELECT 100U M 6.3V
C3313	403 068 3608	CERAMIC 0.033U Z 25V
C3314	403 107 9905	ELECT 10U M 16V
C3316	403 121 3507	ELECT 4.7U M 50V
C3317	403 009 5708	CERAMIC 100P J 50V
C3318	403 011 4904	CERAMIC 120P J 50V
C3320	403 030 6903	CERAMIC 68P J 50V
C3321	403 009 5708	CERAMIC 100P J 50V
C3324	403 068 0409	CERAMIC 0.1U Z 25V
C3325	403 068 0409	CERAMIC 0.1U Z 25V
C3326	403 009 5708	CERAMIC 100P J 50V
C3327	403 009 5708	CERAMIC 100P J 50V
C3328	403 009 5708	CERAMIC 100P J 50V
C3329	403 009 5708	CERAMIC 100P J 50V
C3330	403 068 0409	CERAMIC 0.1U Z 25V
C3335	403 008 7505	CERAMIC 10P D 50V
C3404	403 193 8905	ELECT 22U M 50V
C3502	403 069 5601	CERAMIC 0.01U K 50V
C3503	403 018 7403	CERAMIC 220P J 50V
C3504	403 069 5601	CERAMIC 0.01U K 50V
C3505	403 139 2707	ELECT 1U M 50V
C3506	403 139 1205	ELECT 22U M 10V
C3507	403 193 7601	ELECT 220U M 6.3V
C3508	403 162 1807	ELECT 22U M 10V
C3510	403 069 5601	CERAMIC 0.01U K 50V
C3513	403 010 1102	CERAMIC 1000P J 50V
C3514	403 073 4201	CERAMIC 3900P K 50V
C3516	403 068 0409	CERAMIC 0.1U Z 25V
C3517	403 193 7601	ELECT 220U M 6.3V
C3519	403 068 0409	CERAMIC 0.1U Z 25V
C3520	403 068 6203	CERAMIC 0.068U Z 25V
C3521	403 174 5909	CERAMIC 0.022U Z 25V
C3522	403 069 5601	CERAMIC 0.01U K 50V
C3524	403 010 1102	CERAMIC 1000P J 50V
C3525	403 009 5708	CERAMIC 100P J 50V
C3526	403 071 8102	CERAMIC 2200P K 50V
C3527	403 069 5601	CERAMIC 0.01U K 50V
C3528	403 163 8409	ELECT 47U M 16V
C3530	403 068 0409	CERAMIC 0.1U Z 25V
C3531	403 068 0409	CERAMIC 0.1U Z 25V
C5001	⚠ 404 070 4201	MT-POLYEST 0.068U M 250V
C5002	⚠ 404 070 4201	MT-POLYEST 0.068U M 250V
C5005	⚠ 404 074 1602	CERAMIC 1000P M 250V
C5007	⚠ 404 074 1602	CERAMIC 1000P M 250V
C5010	403 249 0204	ELECT 47U M 400V
C5012	403 247 3702	CERAMIC 3300P K 1K
C5013	403 222 1303	CERAMIC 1000P K 1KV
C5014	403 192 5905	CERAMIC 0.1U K 25V
C5015	403 069 5601	CERAMIC 0.01U K 50V
C5016	403 192 5905	CERAMIC 0.1U K 25V
C5101	403 314 0207	ELECT 1000U M 16V
C5102	403 147 9200	ELECT 1000U M 6.3V
C5103	403 314 0108	ELECT 470U M 16V
C5104	403 125 5507	ELECT 1000U M 16V
C5105	403 304 9302	ELECT 47U M 50V
C5106	403 301 1309	ELECT 47U M 35V
C5107	403 301 1507	ELECT 220U M 6.3V
C5111	403 107 9905	ELECT 10U M 16V
C5112	403 189 2405	ELECT 10U M 16V
C5113	403 189 2405	ELECT 10U M 16V
C5114	403 107 9905	ELECT 10U M 16V
C5115	403 135 7805	ELECT 3.3U M 50V
C5116	403 107 9905	ELECT 10U M 16V
C5117	403 135 7805	ELECT 3.3U M 50V
C5119	403 189 2405	ELECT 10U M 16V
C5122	403 192 5905	CERAMIC 0.1U K 25V
C5125	403 192 5905	CERAMIC 0.1U K 25V
C5127	403 192 5905	CERAMIC 0.1U K 25V
C5128	403 192 5905	CERAMIC 0.1U K 25V
C5129	403 192 5905	CERAMIC 0.1U K 25V
C5135	403 068 0409	CERAMIC 0.1U Z 25V
C7001	403 028 9909	CERAMIC 560P J 50V
C7002	403 028 9909	CERAMIC 560P J 50V
C7003	403 028 9909	CERAMIC 560P J 50V
C7004	403 028 9909	CERAMIC 560P J 50V
C7005	403 167 7002	ELECT 4.7U M 50V
C7006	403 068 0409	CERAMIC 0.1U Z 25V
C8001	403 068 0409	CERAMIC 0.1U Z 25V

LOCATION	PARTS NO. (RESISTORS)	DESCRIPTION
R1001	401 038 3702	MT-GLAZE 33K JA 1/10W
R1002	401 037 9309	MT-GLAZE 18K JA 1/10W
R1003	401 037 5608	MT-GLAZE 10K JA 1/10W
R1004	401 037 9309	MT-GLAZE 18K JA 1/10W
R1006	401 037 5400	MT-GLAZE 1K JA 1/10W
R1007	401 038 3504	MT-GLAZE 330 JA 1/10W
R1008	401 038 3504	MT-GLAZE 330 JA 1/10W
R1009	401 038 9001	MT-GLAZE 680 JA 1/10W
R1010	401 038 2101	MT-GLAZE 2.7K JA 1/10W
R1011	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R1012	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R1013	401 038 5003	MT-GLAZE 390 JA 1/10W
R1014	401 037 5400	MT-GLAZE 1K JA 1/10W
R1015	401 037 5707	MT-GLAZE 100K JA 1/10W
R1017	401 038 5102	MT-GLAZE 3.9K JA 1/10W
R1018	401 037 5400	MT-GLAZE 1K JA 1/10W
R1019	401 037 6704	MT-GLAZE 1.2K JA 1/10W
R1020	401 037 5400	MT-GLAZE 1K JA 1/10W
R1021	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R1022	401 039 0403	MT-GLAZE 8.2K JA 1/10W
R1025	401 037 5400	MT-GLAZE 1K JA 1/10W
R1026	401 038 5102	MT-GLAZE 3.9K JA 1/10W
R1030	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R1031	401 037 5608	MT-GLAZE 10K JA 1/10W
R1032	401 037 5806	MT-GLAZE 1M JA 1/10W
R1034	401 037 5202	MT-GLAZE 100 JA 1/10W
R1035	401 037 8005	MT-GLAZE 15K JA 1/10W
R1039	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R1040	401 037 5202	MT-GLAZE 100 JA 1/10W
R1041	401 038 2101	MT-GLAZE 2.7K JA 1/10W
R1042	401 037 8005	MT-GLAZE 15K JA 1/10W
R1044	401 037 6704	MT-GLAZE 1.2K JA 1/10W
R1045	401 037 6704	MT-GLAZE 1.2K JA 1/10W
R1046	401 037 5400	MT-GLAZE 1K JA 1/10W
R1047	401 038 5003	MT-GLAZE 390 JA 1/10W
R1048	401 018 2701	CARBON 330 JA 1/4W
R1049	401 018 2701	CARBON 330 JA 1/4W
R1050	401 038 7700	MT-GLAZE 5.6K JA 1/10W
R1051	401 038 7700	MT-GLAZE 5.6K JA 1/10W
R1052	401 012 4404	CARBON 100 JA 1/4W
R1053	401 037 5608	MT-GLAZE 10K JA 1/10W
R1054	401 037 5608	MT-GLAZE 10K JA 1/10W
R1055	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R1056	401 019 0904	CARBON 390 JA 1/4W
R1057	401 038 9506	MT-GLAZE 75 JA 1/10W
R1059	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R1061	401 038 0800	MT-GLAZE 22K JA 1/10W
R1062	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R1063	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R1064	401 038 0800	MT-GLAZE 22K JA 1/10W
R1072	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R1073	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R1411	401 038 3603	MT-GLAZE 3.3K JA 1/10W
R1413	401 037 5608	MT-GLAZE 10K JA 1/10W
R1414	401 038 2101	MT-GLAZE 2.7K JA 1/10W
R1415	401 037 5608	MT-GLAZE 10K JA 1/10W
R1416	401 038 7700	MT-GLAZE 5.6K JA 1/10W
R1417	401 037 5608	MT-GLAZE 10K JA 1/10W
R1805	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R1806	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R1808	401 037 5608	MT-GLAZE 10K JA 1/10W
R1809	401 038 2200	MT-GLAZE 27K JA 1/10W
R1810	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R1811	401 038 2002	MT-GLAZE 270 JA 1/10W
R1812	401 038 2002	MT-GLAZE 270 JA 1/10W
R2005	401 038 3702	MT-GLAZE 33K JA 1/10W
R2006	401 037 5608	MT-GLAZE 10K JA 1/10W
R2007	401 038 3900	MT-GLAZE 3.3M JA 1/10W
R2008	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R2009	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R2011	401 038 5102	MT-GLAZE 3.9K JA 1/10W
R2012	401 038 0800	MT-GLAZE 22K JA 1/10W
R2013	401 038 5102	MT-GLAZE 3.9K JA 1/10W
R2014	401 038 7601	MT-GLAZE 560 JA 1/10W
R2015	401 038 6208	MT-GLAZE 47 JA 1/10W
R2016	401 038 2101	MT-GLAZE 2.7K JA 1/10W
R2017	401 011 8809	CARBON 1 JA 1/4W

LOCATION	PARTS NO.	DESCRIPTION
R2018	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R2019	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R2020	401 037 5400	MT-GLAZE 1K JA 1/10W
R2021	401 037 5608	MT-GLAZE 10K JA 1/10W
R2022	401 038 0800	MT-GLAZE 22K JA 1/10W
R2023	401 037 6803	MT-GLAZE 12K JA 1/10W
R2024	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R2025	401 037 6803	MT-GLAZE 12K JA 1/10W
R2026	401 038 3801	MT-GLAZE 330K JA 1/10W
R2027	401 038 1203	MT-GLAZE 240 JA 1/10W
R2028	401 037 7305	MT-GLAZE 1.3K JA 1/10W
R2029	401 038 2200	MT-GLAZE 27K JA 1/10W
R2301	401 038 6505	MT-GLAZE 47K JA 1/10W
R2302	401 038 7700	MT-GLAZE 5.6K JA 1/10W
R2303	401 038 2200	MT-GLAZE 27K JA 1/10W
R2304	401 038 6505	MT-GLAZE 47K JA 1/10W,VHR-789E ONLY
R2305	401 038 6505	MT-GLAZE 47K JA 1/10W
R2306	401 038 6505	MT-GLAZE 47K JA 1/10W,VHR-789E ONLY
R2307	401 038 2200	MT-GLAZE 27K JA 1/10W
R2308	401 038 7700	MT-GLAZE 5.6K JA 1/10W,VHR-789E ONLY
R2309	401 038 7700	MT-GLAZE 5.6K JA 1/10W
R2310	401 038 7700	MT-GLAZE 5.6K JA 1/10W,VHR-789E ONLY
R2311	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R2312	401 038 5003	MT-GLAZE 390 JA 1/10W
R2313	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R2314	401 038 5003	MT-GLAZE 390 JA 1/10W
R2317	401 038 0909	MT-GLAZE 220K JA 1/10W
R2318	401 038 0909	MT-GLAZE 220K JA 1/10W
R2331	401 037 6704	MT-GLAZE 1.2K JA 1/10W
R2332	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R2333	401 017 2702	CARBON 27K JA 1/4W
R2334	401 038 7700	MT-GLAZE 5.6K JA 1/10W
R2335	401 037 5400	MT-GLAZE 1K JA 1/10W
R2336	401 038 7106	MT-GLAZE 510 JA 1/10W
R2337	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R2338	401 038 7106	MT-GLAZE 510 JA 1/10W
R2339	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R2340	401 038 3702	MT-GLAZE 33K JA 1/10W
R2361	401 037 5400	MT-GLAZE 1K JA 1/10W,VHR-789E ONLY
R2362	401 037 5400	MT-GLAZE 1K JA 1/10W,VHR-789E ONLY
R2379	401 038 5102	MT-GLAZE 3.9K JA 1/10W
R2380	401 038 9209	MT-GLAZE 6.8K JA 1/10W
R2381	401 037 5400	MT-GLAZE 1K JA 1/10W
R2385	401 037 6902	MT-GLAZE 120K JA 1/10W
R3001	⚠ 402 067 7402	FUSIBLE RES 3.3 JA 1/2W
R3002	401 038 0800	MT-GLAZE 22K JA 1/10W
R3003	401 038 0800	MT-GLAZE 22K JA 1/10W
R3004	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R3005	401 037 6704	MT-GLAZE 1.2K JA 1/10W
R3006	401 038 2101	MT-GLAZE 2.7K JA 1/10W
R3008	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R3009	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R3010	401 038 3801	MT-GLAZE 330K JA 1/10W
R3011	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R3012	401 038 0602	MT-GLAZE 220 JA 1/10W
R3013	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R3014	401 037 8005	MT-GLAZE 15K JA 1/10W
R3015	401 037 8005	MT-GLAZE 15K JA 1/10W
R3016	401 037 7909	MT-GLAZE 1.5K JA 1/10W
R3017	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R3018	401 037 5608	MT-GLAZE 10K JA 1/10W
R3019	401 037 5707	MT-GLAZE 100K JA 1/10W
R3021	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R3022	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R3023	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R3024	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R3029	401 037 5400	MT-GLAZE 1K JA 1/10W
R3032	401 038 5300	MT-GLAZE 39K JA 1/10W
R3035	401 038 0800	MT-GLAZE 22K JA 1/10W
R3036	401 038 0800	MT-GLAZE 22K JA 1/10W
R3037	401 037 5400	MT-GLAZE 1K JA 1/10W
R3038	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R3039	401 037 5400	MT-GLAZE 1K JA 1/10W
R3040	401 037 5400	MT-GLAZE 1K JA 1/10W
R3064	401 038 0800	MT-GLAZE 22K JA 1/10W
R3065	401 037 8203	MT-GLAZE 1.5M JA 1/10W
R3066	401 038 3702	MT-GLAZE 33K JA 1/10W
R3067	401 038 6505	MT-GLAZE 47K JA 1/10W
R3068	401 038 0800	MT-GLAZE 22K JA 1/10W
R3069	401 037 8203	MT-GLAZE 1.5M JA 1/10W
R3070	401 038 3702	MT-GLAZE 33K JA 1/10W
R3071	401 038 6505	MT-GLAZE 47K JA 1/10W
R3072	401 037 7800	MT-GLAZE 150 JA 1/10W
R3073	401 037 8104	MT-GLAZE 150K JA 1/10W
R3074	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R3075	401 038 3504	MT-GLAZE 330 JA 1/10W
R3076	401 037 5400	MT-GLAZE 1K JA 1/10W
R3077	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R3078	401 012 4404	CARBON 100 JA 1/4W
R3094	401 037 9309	MT-GLAZE 18K JA 1/10W
R3095	401 037 5400	MT-GLAZE 1K JA 1/10W
R3301	401 038 5003	MT-GLAZE 390 JA 1/10W
R3302	401 037 7909	MT-GLAZE 1.5K JA 1/10W
R3309	⚠ 402 078 2908	FUSIBLE RES 680 GA 1/4W
R3312	401 038 3603	MT-GLAZE 3.3K JA 1/10W
R3313	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R3501	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R3502	401 038 0909	MT-GLAZE 220K JA 1/10W
R3503	401 037 5400	MT-GLAZE 1K JA 1/10W
R3509	401 037 5608	MT-GLAZE 10K JA 1/10W
R3510	401 038 9001	MT-GLAZE 680 JA 1/10W
R3511	401 038 9001	MT-GLAZE 680 JA 1/10W
R3514	401 038 3702	MT-GLAZE 33K JA 1/10W
R3515	401 037 5608	MT-GLAZE 10K JA 1/10W
R3516	401 038 3702	MT-GLAZE 33K JA 1/10W
R3517	401 037 5608	MT-GLAZE 10K JA 1/10W
R3519	401 037 5400	MT-GLAZE 1K JA 1/10W
R3520	401 037 5707	MT-GLAZE 100K JA 1/10W
R3521	401 037 5400	MT-GLAZE 1K JA 1/10W
R3522	401 038 0602	MT-GLAZE 220 JA 1/10W
R3523	401 037 5202	MT-GLAZE 100 JA 1/10W
R3524	401 037 5400	MT-GLAZE 1K JA 1/10W
R3525	401 038 5904	MT-GLAZE 4.3K JA 1/10W
R3526	401 037 5400	MT-GLAZE 1K JA 1/10W
R3527	401 038 5904	MT-GLAZE 4.3K JA 1/10W
R3528	401 037 5400	MT-GLAZE 1K JA 1/10W
R3529	401 038 5904	MT-GLAZE 4.3K JA 1/10W
R3531	401 037 5608	MT-GLAZE 10K JA 1/10W
R3532	401 038 0800	MT-GLAZE 22K JA 1/10W
R3533	401 038 9209	MT-GLAZE 6.8K JA 1/10W
R3535	401 037 5608	MT-GLAZE 10K JA 1/10W
R3537	401 037 5608	MT-GLAZE 10K JA 1/10W
R3539	401 012 5609	CARBON 1K JA 1/4W
R5001	402 013 9108	SOLID 2.7M KB 1/2W
R5002	401 021 4907	CARBON 560K JA 1/4W
R5003	401 021 4907	CARBON 560K JA 1/4W
R5010	401 060 9901	OXIDE-MT 3.3 JA 1W
R5011	401 015 0403	CARBON 18 JA 1/4W
R5012	401 064 7309	OXIDE-MT 100 JA 2W
R5013	401 037 5400	MT-GLAZE 1K JA 1/10W
R5014	401 038 5003	MT-GLAZE 390 JA 1/10W
R5015	401 037 6704	MT-GLAZE 1.2K JA 1/10W
R5016	401 038 9001	MT-GLAZE 680 JA 1/10W
R5017	401 038 2101	MT-GLAZE 2.7K JA 1/10W
R5101	401 019 0904	CARBON 390 JA 1/4W
R5102	401 037 7800	MT-GLAZE 150 JA 1/10W
R5103	401 038 7601	MT-GLAZE 560 JA 1/10W
R5104	401 012 6903	CARBON 10K JA 1/4W
R5105	401 016 2505	CARBON 220 JA 1/4W
R5106	401 020 0702	CARBON 470 JA 1/4W
R5108	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R5109	401 038 3603	MT-GLAZE 3.3K JA 1/10W
R5110	⚠ 402 071 3100	FUSIBLE RES 27 JA 1/4W
R5111	401 038 7601	MT-GLAZE 560 JA 1/10W
R5113	401 037 5608	MT-GLAZE 10K JA 1/10W
R5116	401 038 2101	MT-GLAZE 2.7K JA 1/10W
R5119	401 038 6505	MT-GLAZE 47K JA 1/10W
R5120	⚠ 402 004 0107	FUSIBLE RES 10 JA 1/4W
R5121	401 017 7509	CARBON 3.9 JA 1/4W
R5122	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R5123	401 039 0304	MT-GLAZE 820 JA 1/10W
R5126	401 037 5400	MT-GLAZE 1K JA 1/10W
R5127	401 037 5400	MT-GLAZE 1K JA 1/10W
R5135	401 037 6605	MT-GLAZE 120 JA 1/10W
R7001	401 037 5608	MT-GLAZE 10K JA 1/10W
R7002	401 037 5608	MT-GLAZE 10K JA 1/10W

LOCATION	PARTS NO.	DESCRIPTION	
R7003	401 037 5608	MT-GLAZE	10K JA 1/10W
R7004	401 037 5608	MT-GLAZE	10K JA 1/10W
R7005	401 038 7601	MT-GLAZE	560 JA 1/10W
R7006	401 038 7601	MT-GLAZE	560 JA 1/10W
R7007	401 038 7601	MT-GLAZE	560 JA 1/10W
R7008	401 038 7601	MT-GLAZE	560 JA 1/10W
R7009	401 038 9308	MT-GLAZE	68K JA 1/10W
R7010	401 038 9308	MT-GLAZE	68K JA 1/10W
R7011	401 038 9308	MT-GLAZE	68K JA 1/10W
R7012	401 038 9308	MT-GLAZE	68K JA 1/10W
R7013	401 038 9308	MT-GLAZE	68K JA 1/10W
R7018	401 016 2505	CARBON	220 JA 1/4W,VHR-779E ONLY
R8003	401 017 0708	CARBON	270 JA 1/4W
R8004	401 014 2804	CARBON	150 JA 1/4W
R8005	401 017 0708	CARBON	270 JA 1/4W
	(JUMPERS)		
	401 037 5004	MT-GLAZE	0.000 ZA 1/10W
	(SWITCHES)		
S7001	645 006 2797	SWITCH,PUSH 1P-1T, REC,VHR-779E ONLY	
OR	645 001 9777	SWITCH,PUSH 1P-1T, REC,VHR-779E ONLY	
OR	645 008 8049	SWITCH,PUSH 1P-1T, REC,VHR-779E ONLY	
S7002	645 008 8049	SWITCH,PUSH 1P-1T, CH UP	
OR	645 006 2797	SWITCH,PUSH 1P-1T, CH UP	
OR	645 001 9777	SWITCH,PUSH 1P-1T, CH UP	
S7003	645 001 9777	SWITCH,PUSH 1P-1T, FF,VHR-779E ONLY	
OR	645 008 8049	SWITCH,PUSH 1P-1T, FF,VHR-779E ONLY	
OR	645 006 2797	SWITCH,PUSH 1P-1T, FF,VHR-779E ONLY	
S7004	645 008 8049	SWITCH,PUSH 1P-1T, CH DOWN, VHR-779E ONLY	
OR	645 006 2797	SWITCH,PUSH 1P-1T, CH DOWN, VHR-779E ONLY	
OR	645 001 9777	SWITCH,PUSH 1P-1T, CH DOWN, VHR-779E ONLY	
S7004	645 008 8063	SWITCH,PUSH 1P-1T, CH DOWN, VHR-789E ONLY	
S7005	645 008 8049	SWITCH,PUSH 1P-1T, REW,VHR-779E ONLY	
OR	645 006 2797	SWITCH,PUSH 1P-1T, REW,VHR-779E ONLY	
OR	645 001 9777	SWITCH,PUSH 1P-1T, REW,VHR-779E ONLY	
S7006	645 008 8049	SWITCH,PUSH 1P-1T, POWER,VHR-779E ONLY	
OR	645 006 2797	SWITCH,PUSH 1P-1T, POWER,VHR-779E ONLY	
OR	645 001 9777	SWITCH,PUSH 1P-1T, POWER,VHR-779E ONLY	
S7007	645 006 2797	SWITCH,PUSH 1P-1T, PAUSE,VHR-779E ONLY	
OR	645 001 9777	SWITCH,PUSH 1P-1T, PAUSE,VHR-779E ONLY	
OR	645 008 8049	SWITCH,PUSH 1P-1T, PAUSE,VHR-779E ONLY	
S7008	645 001 9777	SWITCH,PUSH 1P-1T, PLAY,VHR-779E ONLY	
OR	645 006 2797	SWITCH,PUSH 1P-1T, PLAY,VHR-779E ONLY	
OR	645 008 8049	SWITCH,PUSH 1P-1T, PLAY,VHR-779E ONLY	
S7010	645 006 2797	SWITCH,PUSH 1P-1T, STOP/EJECT, VHR-779E ONLY	
OR	645 008 8049	SWITCH,PUSH 1P-1T, STOP/EJECT, VHR-779E ONLY	
OR	645 001 9777	SWITCH,PUSH 1P-1T, STOP/EJECT, VHR-779E ONLY	
S8001	645 029 7076	SWITCH,MODE 1P-1T VC, SWITCH MODE	
S8002	645 029 7069	SWITCH,DETECTOR 1P-1T VC, SWITCH EP	
	(REMOTE RECEIVERS)		
RR701	645 027 5654	UNIT,IR RECEIVER PACK	
	(DISPLAYS)		
A7001	645 031 0096	FLUORESCENT TUBE	
OR	645 031 0089	FLUORESCENT TUBE	
	(FUSES)		
F5001	⚠ 423 022 6506	FUSE 250V 2.5A	
OR	⚠ 423 025 9900	FUSE 250V 2.5A	
OR	⚠ 423 021 8402	FUSE 250V 2.5A	
	(PROTECTORS)		
PR511	⚠ 645 005 9834	PROTECTOR,IC 1.0A 50V	
PR512	⚠ 645 014 2550	PROTECTOR,2A 125V	
PR513	⚠ 645 014 2529	PROTECTOR,1.25A 125V	
	(JACKS)		
JK231	645 032 8954	JACK,RCA-2,VHR-789E ONLY	
	(PHOTO COUPLES)		
PC801	407 206 6704	PHOTO COUPLE SG-269	
PC802	407 206 6704	PHOTO COUPLE SG-269	
	(MISCELLANEOUS)		
	613 053 8048	FIXER	
	645 016 0479	HOLDER,FUSE,F5001	
OR	645 008 7660	HOLDER,FUSE,F5001	
OR	645 008 7677	HOLDER,FUSE,F5001	

LOCATION	PARTS NO.	DESCRIPTION
	613 164 2447	HOLDER FL, FL
OR	613 183 5337	HOLDER FL, FL
	613 183 7553	HOLDER LED, PSLED,VHR-779E ONLY
	613 182 3334	HOLDER,LED VC
	613 182 3341	HOLDER,END SENSOR VC

COMPL PWB,TM-1

	613 184 7767	VHR-789E ONLY
	(CONNECTORS)	
CN711	645 010 2349	SOCKET,FFC 15P (N.S.P),VHR-789E ONLY
OR	645 009 4194	SOCKET,FFC 15P (N.S.P),VHR-789E ONLY
	(SEMICONDUCTORS)	
Q7101	405 000 2908	TR DTC114EK,VHR-789E ONLY
Q7102	405 000 2908	TR DTC114EK,VHR-789E ONLY
Q7103	405 000 2908	TR DTC114EK,VHR-789E ONLY
Q7104	405 000 2908	TR DTC114EK,VHR-789E ONLY
Q7105	405 000 2908	TR DTC114EK,VHR-789E ONLY
Q7106	405 000 2908	TR DTC114EK,VHR-789E ONLY
	(DIODES)	
D7101	408 040 4208	LED SEL2513EMTP6-C, STOP,VHR-789E ONLY
OR	408 040 4307	LED SEL2513EMTP6-D, STOP,VHR-789E ONLY
OR	408 040 3607	LED SLZ-796C-01H-AB-T1, STOP, VHR-789E ONLY
D7102	408 040 4208	LED SEL2513EMTP6-C, STOP,VHR-789E ONLY
OR	408 040 3607	LED SLZ-796C-01H-AB-T1, STOP, VHR-789E ONLY
OR	408 040 4307	LED SEL2513EMTP6-D, STOP,VHR-789E ONLY
D7103	408 040 4208	LED SEL2513EMTP6-C, REW,VHR-789E ONLY
OR	408 040 4307	LED SEL2513EMTP6-D, REW,VHR-789E ONLY
OR	408 040 3607	LED SLZ-796C-01H-AB-T1, REW, VHR-789E ONLY
D7104	408 040 4208	LED SEL2513EMTP6-C, FF,VHR-789E ONLY
OR	408 040 4307	LED SEL2513EMTP6-D, FF,VHR-789E ONLY
OR	408 040 3607	LED SLZ-796C-01H-AB-T1, FF,VHR-789E ONLY
D7105	408 040 3607	LED SLZ-796C-01H-AB-T1, PLAY, VHR-789E ONLY
OR	408 040 4307	LED SEL2513EMTP6-D, PLAY,VHR-789E ONLY
OR	408 040 4208	LED SEL2513EMTP6-C, PLAY,VHR-789E ONLY
D7106	408 039 5308	LED SLZ-996E-01H-AB-T1, REC,VHR-789E ONLY
OR	407 162 2901	LED SEL2213CM-TP6-D,VHR-789E ONLY
D7107	408 040 3607	LED SLZ-796C-01H-AB-T1, PAUSE, VHR-789E ONLY
OR	408 040 4307	LED SEL2513EMTP6-D, PAUSE,VHR-789E ONLY
OR	408 040 4208	LED SEL2513EMTP6-C, DMSS,VHR-789E ONLY
D7108	408 040 3607	LED SLZ-796C-01H-AB-T1, PAUSE, VHR-789E ONLY
OR	408 040 4307	LED SEL2513EMTP6-D, PAUSE,VHR-789E ONLY
OR	408 040 4208	LED SEL2513EMTP6-C, DMSS,VHR-789E ONLY
	(RESISTORS)	
R7101	401 015 1509	CARBON 180 JA 1/4W,VHR-789E ONLY
R7102	401 015 1509	CARBON 180 JA 1/4W,VHR-789E ONLY
R7103	401 015 1509	CARBON 180 JA 1/4W,VHR-789E ONLY
R7104	401 015 1509	CARBON 180 JA 1/4W,VHR-789E ONLY
R7105	401 015 1509	CARBON 180 JA 1/4W,VHR-789E ONLY
R7106	401 015 1509	CARBON 180 JA 1/4W,VHR-789E ONLY
R7107	401 015 1509	CARBON 180 JA 1/4W,VHR-789E ONLY
R7108	401 015 1509	CARBON 180 JA 1/4W,VHR-789E ONLY
	(SWITCHES)	
S7101	613 093 8596	SW,PUSH, REC,VHR-789E ONLY
OR	645 005 1302	SWITCH,PUSH 1P-1T, REC,VHR-789E ONLY
S7102	613 093 8596	SW,PUSH, FF,VHR-789E ONLY
OR	645 005 1302	SWITCH,PUSH 1P-1T, FF,VHR-789E ONLY
S7103	645 005 1302	SWITCH,PUSH 1P-1T, REW,VHR-789E ONLY
OR	613 093 8596	SW,PUSH, REW,VHR-789E ONLY
S7104	613 093 8596	SW,PUSH, PAUSE,VHR-789E ONLY
OR	645 005 1302	SWITCH,PUSH 1P-1T, PAUSE,VHR-789E ONLY
S7105	613 093 8596	SW,PUSH, PLAY,VHR-789E ONLY
OR	645 005 1302	SWITCH,PUSH 1P-1T, PLAY,VHR-789E ONLY
S7106	645 005 1302	SWITCH,PUSH 1P-1T, STOP/EJECT, VHR-789E ONLY
OR	613 093 8596	SW,PUSH, STOP/EJECT,VHR-789E ONLY
S7107	645 006 2797	SWITCH,PUSH 1P-1T, REC,VHR-789E ONLY
OR	645 001 9777	SWITCH,PUSH 1P-1T, REC LIST DELUX, VHR-789E ONLY
OR	645 008 8049	SWITCH,PUSH 1P-1T, REC LIST DELUX, VHR-789E ONLY

LOCATION	PARTS NO.	DESCRIPTION
COMPL PWB,TM-2		
	613 184 4797	VHR-789E ONLY
	(CONNECTORS)	
CN722	645 003 1755	SOCKET,RIBBON 4P (N.S.P),VHR-789E ONLY
	(DIODES)	
D7201	408 040 4109	LED SEL2415EMTP6-D, POWER LED, VHR-789E ONLY
OR	408 040 4000	LED SEL2415EMTP6-C, POWER LED, VHR-789E ONLY
OR	408 039 4509	LED SLZ-381B-09H-AB-T1, POWER LED, VHR-789E ONLY
	(RESISTORS)	
R7204	401 014 2804	CARBON 150 JA 1/4W,VHR-789E ONLY
	(SWITCHES)	
S7201	613 093 8596	SW,PUSH, POWER,VHR-789E ONLY
OR	645 005 1302	SWITCH,PUSH 1P-1T, POWER,VHR-789E ONLY
OR	613 006 3700	PUSH SWITCH, POWER,VHR-789E ONLY
OR	613 079 4178	SW,PUSH, POWER,VHR-789E ONLY
COMPL PWB,TB-1		
	613 184 9259	VHR-789E ONLY
	613 183 6204	VHR-779E ONLY
	(CONNECTORS)	
CN851	645 008 5031	PLUG,8P (N.S.P),VHR-789E ONLY
OR	645 013 4548	PLUG,6P (N.S.P),VHR-779E ONLY
CN861	645 003 0918	PLUG,9P (N.S.P)
CN871	645 021 1096	SOCKET,RGB 21P (N.S.P)
OR	645 018 7605	SOCKET,RGB 21P (N.S.P)
CN872	645 018 7605	SOCKET,RGB 21P (N.S.P),VHR-789E ONLY
OR	645 021 1096	SOCKET,RGB 21P (N.S.P),VHR-789E ONLY
	(DIODES)	
D8613	407 099 7000	ZENER DIODE MTZJ15B
	(INDUCTORS)	
L8502	645 025 0644	INDUCTOR,0.75UH
L8503	645 025 0644	INDUCTOR,0.75UH,VHR-789E ONLY
	(CAPACITORS)	
C8504	403 018 7403	CERAMIC 220P J 50V
C8508	403 010 1102	CERAMIC 1000P J 50V
C8513	403 018 7403	CERAMIC 220P J 50V,VHR-789E ONLY
C8524	403 018 7403	CERAMIC 220P J 50V
C8528	403 010 1102	CERAMIC 1000P J 50V
C8533	403 018 7403	CERAMIC 220P J 50V,VHR-789E ONLY
	(RESISTORS)	
R8502	401 037 5400	MT-GLAZE 1K JA 1/10W
R8504	401 038 9001	MT-GLAZE 680 JA 1/10W
R8508	401 037 5400	MT-GLAZE 1K JA 1/10W,VHR-789E ONLY
R8522	401 037 5400	MT-GLAZE 1K JA 1/10W
R8524	401 038 9001	MT-GLAZE 680 JA 1/10W
R8528	401 037 5400	MT-GLAZE 1K JA 1/10W,VHR-789E ONLY
R8591	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R8592	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R8601	401 038 9506	MT-GLAZE 75 JA 1/10W
R8602	401 038 9506	MT-GLAZE 75 JA 1/10W,VHR-789E ONLY
	(JUMPERS)	
	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
COMPL PWB,TN-6		
	613 181 8224	
	(CONNECTORS)	
CN681	645 003 0925	PLUG,11P (N.S.P)
	(SEMICONDUCTORS)	
Q6803	405 015 8407	TR 2SC2812-L5
OR	405 015 8704	TR 2SC2812-L6
OR	405 014 4509	TR 2SC2412K-R
OR	405 014 4608	TR 2SC2412K-S
	(INTEGRATED CIRCUITS)	
IC681	409 409 4600	IC TDA9874H
OR	409 409 4600	IC TDA9874H
	(DIODES)	
D6801	407 169 8005	VARACTOR DI BB405B
OR	407 205 7702	VARACTOR DI BB135

LOCATION	PARTS NO.	DESCRIPTION
	(CRYSTAL DEVICES)	
X6801	645 026 6928	OSC,CRYSTAL 24.576MHZ
	(INDUCTORS)	
L6802	645 005 3887	INDUCTOR,2.2U M
OR	645 001 5441	INDUCTOR,2.2U K
L6803	645 005 3870	INDUCTOR,1.8U M
OR	645 002 1640	INDUCTOR,1.8U K
L6806	645 001 5441	INDUCTOR,2.2U K
OR	645 005 3887	INDUCTOR,2.2U M
L6808	645 005 3887	INDUCTOR,2.2U M
OR	645 001 5441	INDUCTOR,2.2U K
L6810	645 001 5441	INDUCTOR,2.2U K
OR	645 005 3887	INDUCTOR,2.2U M
L6811	645 001 5441	INDUCTOR,2.2U K
OR	645 005 3887	INDUCTOR,2.2U M
L6812	645 005 3887	INDUCTOR,2.2U M
OR	645 001 5441	INDUCTOR,2.2U K
	(CAPACITORS)	
C6801	403 215 3109	CERAMIC 0.1U Z 16V
C6803	403 026 2803	CERAMIC 47P J 50V
C6804	403 215 3109	CERAMIC 0.1U Z 16V
C6806	403 069 5601	CERAMIC 0.01U K 50V
C6807	403 121 3507	ELECT 4.7U M 50V
C6808	403 109 6308	ELECT 1U M 50V
C6809	403 012 6808	CERAMIC 15P J 50V
C6810	403 206 8601	CERAMIC 0.33U Z 16V
C6811	403 073 1200	CERAMIC 0.033U K 50V
C6812	403 069 5601	CERAMIC 0.01U K 50V
C6813	403 121 3507	ELECT 4.7U M 50V
C6815	403 215 3109	CERAMIC 0.1U Z 16V
C6817	403 069 5601	CERAMIC 0.01U K 50V
C6818	403 121 3507	ELECT 4.7U M 50V
C6820	403 163 7907	ELECT 47U M 6.3V
C6824	403 215 3109	CERAMIC 0.1U Z 16V
C6826	403 069 5601	CERAMIC 0.01U K 50V
C6828	403 069 5601	CERAMIC 0.01U K 50V
C6830	403 069 5601	CERAMIC 0.01U K 50V
C6831	403 121 3507	ELECT 4.7U M 50V
C6832	403 069 5601	CERAMIC 0.01U K 50V
C6833	403 135 4002	ELECT 47U M 6.3V
C6834	403 069 5601	CERAMIC 0.01U K 50V
C6835	403 125 5606	ELECT 100U M 16V
C6838	403 121 3408	ELECT 2.2U M 50V
C6841	403 121 3408	ELECT 2.2U M 50V
C6842	403 069 5601	CERAMIC 0.01U K 50V
C6843	403 069 5601	CERAMIC 0.01U K 50V
C6844	403 012 6808	CERAMIC 15P J 50V
C6847	403 135 4002	ELECT 47U M 6.3V
	(RESISTORS)	
R6803	401 039 0403	MT-GLAZE 8.2K JA 1/10W
R6804	401 038 5300	MT-GLAZE 39K JA 1/10W
R6805	401 037 5608	MT-GLAZE 10K JA 1/10W
R6806	401 038 5300	MT-GLAZE 39K JA 1/10W
R6812	401 037 5400	MT-GLAZE 1K JA 1/10W
R6816	401 037 5400	MT-GLAZE 1K JA 1/10W
R6817	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R6818	401 037 5608	MT-GLAZE 10K JA 1/10W
R6819	401 038 0800	MT-GLAZE 22K JA 1/10W
R6822	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R6823	401 038 6406	MT-GLAZE 4.7K JA 1/10W
	(JUMPERS)	
	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
FLEXIBLE FLAT CABLE		
	645 031 6081	FLEXIBLE FLAT CABLE, CP1(CN351)-STATOR CYL(CN1)
	645 032 2136	FLEXIBLE FLAT CABLE,CN701-CN711, VHR-789E ONLY

SANYO Electric Co.,Ltd.
Osaka, Japan

Jan./'99/1500 NS Printed in Japan

VHR-779E
VHR-789E

BLOCK DIAGRAMS,CIRCUIT DIAGRAMS & PRINTED WIRING BOARDS

TABLE OF CONTENTS

Page

1. OVERALL WIRING & BLOCK DIAGRAMS

OVERALL WIRING 1
AUDIO CIRCUIT 3
VIDEO CIRCUIT 5
SYSTEM CONTROL & SERVO CIRCUIT 8

2. CIRCUIT DIAGRAMS & PRINTED WIRING BOARDS (P.W.B.)

CP-1 BOARD (PW-A) POWER SUPPLY 11
CP-1 BOARD (MC-A) MECHANISM SENSOR 13
CP-1 BOARD (VA-A) VIDEO & AUDIO 14
VIDEO CIRCUIT WAVEFORMS 16
CP-1 BOARD (AD-A) HIFI AUDIO 17
CP-1 BOARD (TC-A) VPS/PDC 19
CP-1 BOARD (TM-A) DISPLAY (FLD) & KEY SCAN 20
TM-1 BOARD SWITCH & LED (VHR-789E ONLY) 20
TM-2 BOARD SWITCH (VHR-789E ONLY) 21
A7001 DISPLAY (FLD) GRID/ANODE ASSIGNMENT DRAWING & TABLE 21
TM-1 P.W.B. (VHR-789E ONLY) 21
TM-2 P.W.B. (VHR-789E ONLY) 22
IC301 SYSTEM CONTROL, TIMER, TUNING CONTROL, OSC & SERVO MPU PIN FUNCTIONS 23
SERVO CIRCUIT WAVEFORMS 23
CP-1 BOARD (SY-A) SYSTEM CONTROL, TIMER, TUNER, OSC & SERVO 24
CP-1 P.W.B. 26
TB-1 BOARD TERMINAL 29
TB-1 P.W.B. 31
TN-6 BOARD MTS & NICAM DECODER 32
TN-6 P.W.B. 33

SE4HN/E3, E2 91N

REFERENCE No.SM5310000

NOTES:

1. All resistance values in "OHMS" unless otherwise noted.
   (K=1,000; M=1,000,000)
2. All capacitance values in "μF" unless otherwise noted.
   p=pico farad ; μ,u or U=micro farad
3. All inductance values in "μH" unless otherwise noted.
   μ,u or U=micro henry ; m=milli henry

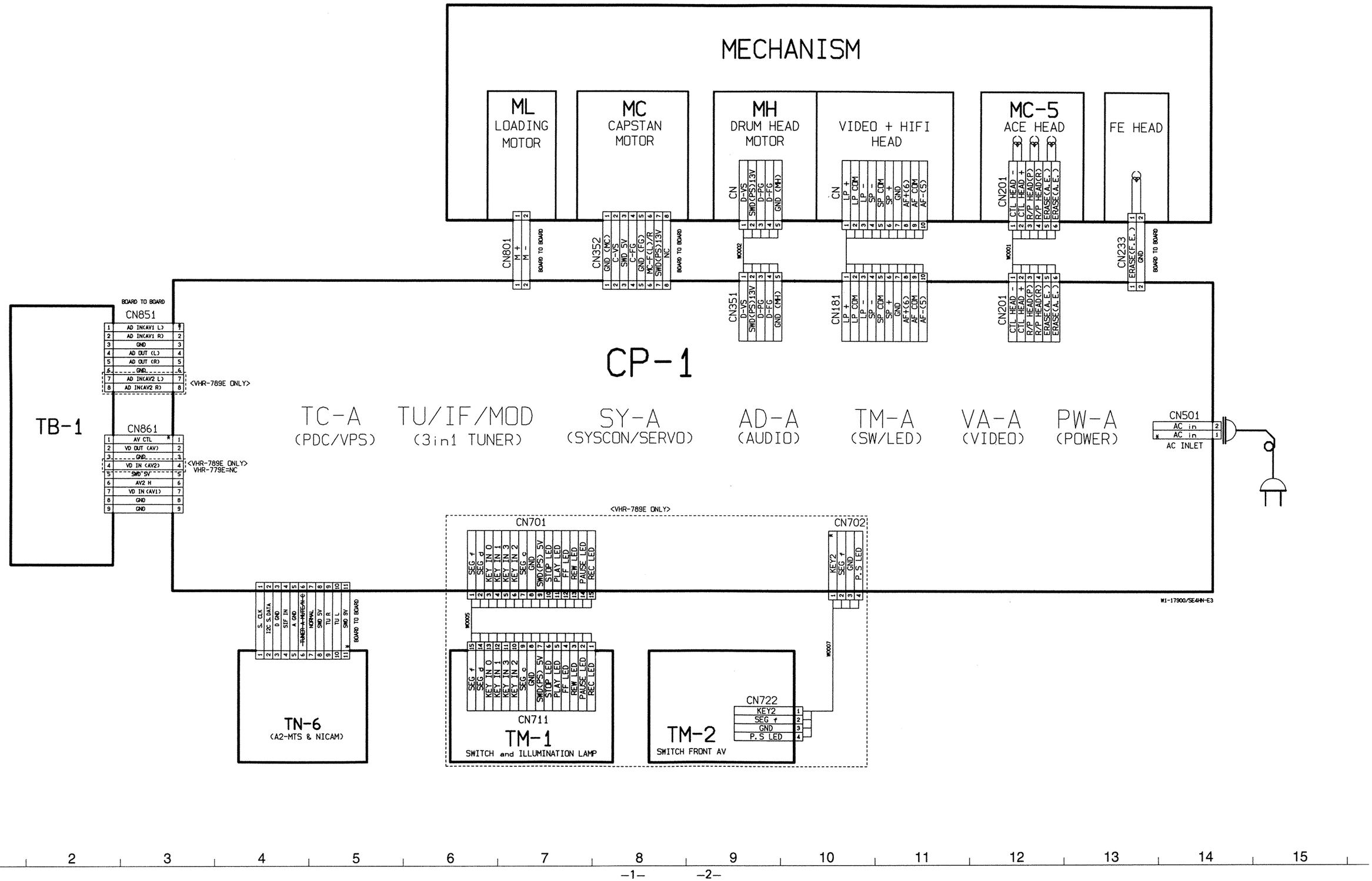
PRODUCT SAFETY NOTICE

THE COMPONENTS DESIGNATED BY A SYMBOL (⚠) IN THIS SCHEMATIC DIAGRAM DESIGNATES COMPONENTS WHOSE VALUE ARE OF SPECIAL SIGNIFICANCE TO PRODUCT SAFETY. SHOULD ANY COMPONENT DESIGNATED BY A SYMBOL NEED TO BE REPLACED, USE ONLY THE PART DESIGNATED IN THE PARTS LIST.
DO NOT DEVIATE FROM THE RESISTANCE, WATTAGE AND VOLTAGE RATINGS SHOWN.

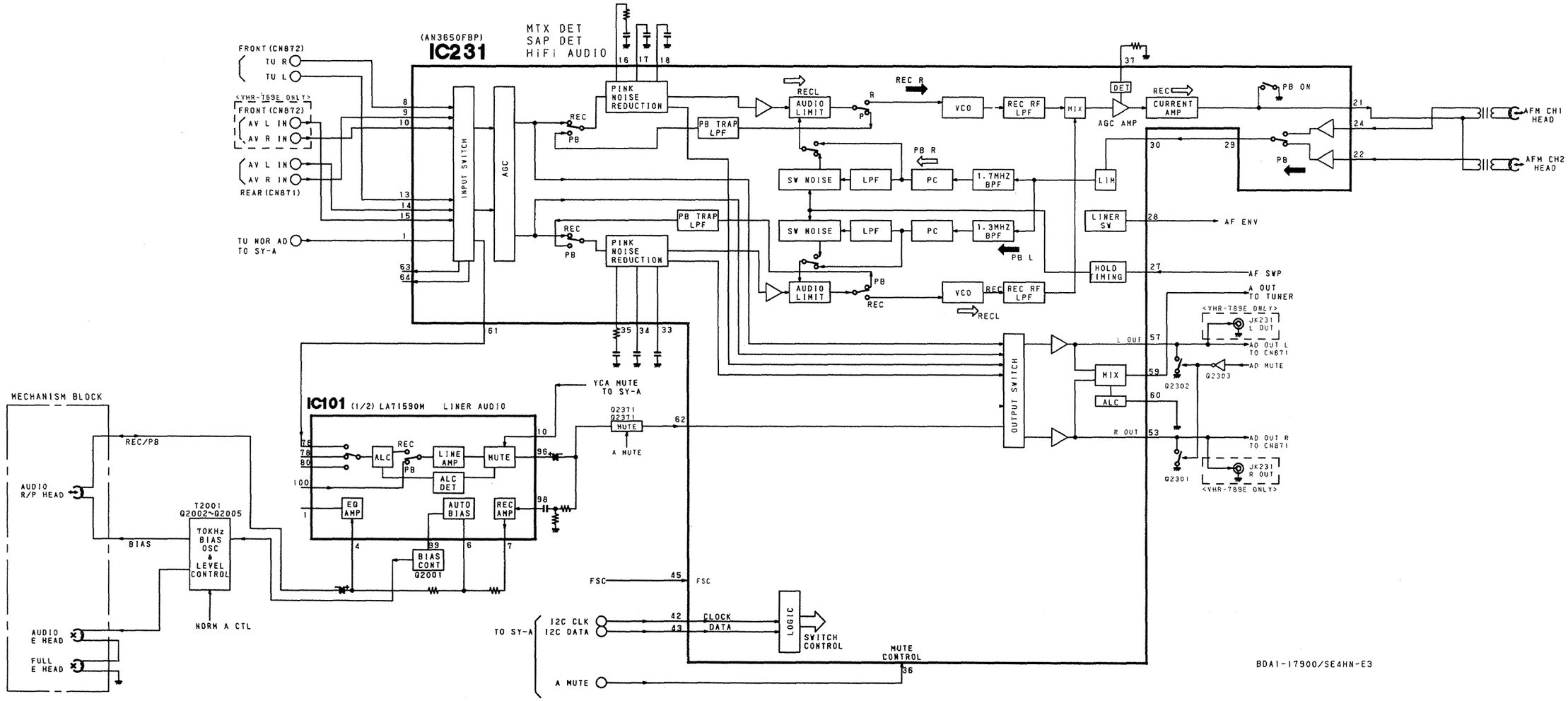
EXPLANATORY NOTES (EXAMPLES)

Resistor	10K:1/16J means 10kilo ohm ±5%, 1/16watt max.
	1M:1/10K means 1mega ohm ±10%, 1/10watt max.
Capacitor	0.047:F means 0.047micro farad, Ftype.
Electrolytic capacitor	
	10:16 means 10micro farad, 16volt max.
Inductor	330:J means 330micro henry ±5%
	470:K means 470micro henry ±10%
	No description J or K means ±5%

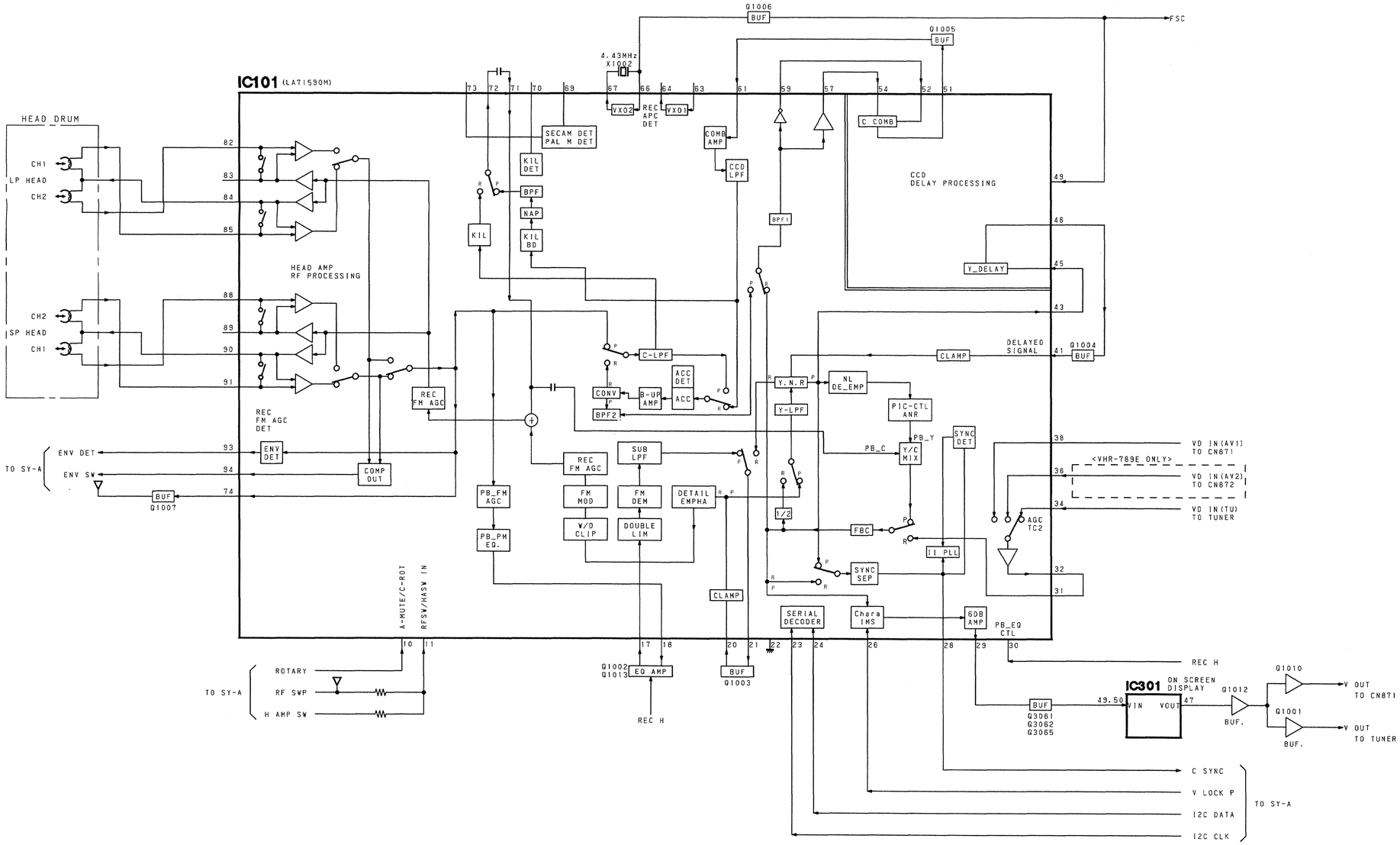
OVERALL WIRING



AUDIO CIRCUIT



VIDEO CIRCUIT



IC301 (1/2) MPU
SYSTEM CONTROL , OSD
TIMER , TUNING CONTROL

Q3009
Q3010
POWER DOWN DET → 80 POWER DOWN

POWER SAVE (TO PW-A) ← 97 PS CTL

POWER CTL (TO PW-A) ← 10 POWER CTL

IC305
INITIALIZE RESET → 25 RESET

IC302
LOADING MOTOR (ML) 10 / 2 → LOADING MOTOR DRIVER 4 / 3 → 6 ML-D, 7 ML-S

MECHANISM MODE SWITCH (ROTARY SW) → 9 SW DATA 0, 11 SW DATA 1, 12 SW DATA 2

TAKE-UP REEL SENSOR, SUPPLY REEL SENSOR → Q3008 WAVEFORM SHAPE → 3 T REEL P.

Q3007 WAVEFORM SHAPE → 4 S REEL P.

TAPE TOP SENSOR → 88 T.TOP.S

TAPE END LED, TAPE END SENSOR → 89 T.END.S

FL START SW/ ERASE PREVENTION SWITCH → 8 FL START +SAFETY SW

OSCO 37 ← X3002 14.32MHz
OSCI 38
XI 40 ← X3001 32KHZ
XO 41

AV CTL 86 → AV CTL
ALT OFF H. 63 → ALT OFF H.
ENV SW 100 → ENV SW
TU C SYNC 28 → C SYNC
PB L 44
VD MUTE 61
YCA MUTE 62 → YCA MUTE
A MUTE 78 → A MUTE
VD-IN 49 ← 50 BUF Q3062 Q3065 ← VD (TO MCOM)
VD OUT 47 → VD (FR MCOM)
→ TO VA-A

NORMA CTL 91 → NORMA CTL
REC H 60 → REC H
→ I2C CLK, I2C DATA, I2C CLK, I2C DATA → TO VA-A
→ TO AD-A

I2C CLK 18 → I2C CLK
I2C DATA 17 → I2C DATA
→ TO TC-A

RR701 IR REMOTE CONTROL RECEIVER → 5 REMOCON

OPERATION KEY-MATRIX: KEY IN 0 ~ KEY IN 3, b ~ k (KEY SCAN)

A7001 DISPLAY (FLD): SEG a ~ SEG l, SEGMENT, G1 ~ G9, GRID, HEATER+

IC701 FLD DRIVE AND KEY SCAN
28 KEY IN 0 ~ 29 KEY IN 3
31 SEG a ~ 42 SEG l
6 G1 ~ 15 G9
FLD_CS 22 → 27 FLD CS
FLD_CK 23 → 14 FLD CLK
FLD_DO 24 → 16 FLD DATA OUT
FLD_DI 25 → 15 FLD DATA IN

3 IN 1 TUNER (TU/IF BLOCK)

ANT → IN
SW1 19 → 87 TU SW1
SW2 20 → 86 TU SW2
AFT 23 → 83 AFTC
S CLK 5, S DATA 3
S CLK 11, S DATA 12
IF 22 SIF IN
A.OUT 21 → TU AUDIO NORM (TO AD-A)
V.OUT 24 → VIDEO OUT (TO VA-A)
Q3301, Q3302

TUNER A MUTE 22
TN CLK 56
TN DATA 57

IC681 TN-6

Q6803 BUF 25 ← MTS&NICAM DECODER
TU L OUT 1, TU R OUT 2 → TO AD-A
30 I2C S DATA, 29 S CLK

IC301 (1/2) SERVO (MN101D02EBE)

84 ~ 100

TRACKING CTL 85
REC CTL DRIVER
WAVEFORM SHAPER 74 CTL+, 75 CTL-
Vref 70
TAPE SPEED DET
PLAY / REC
CAP PHASE CTL
F-DIVIDER
CAP SPEED CTL
CFG 68 / 67
WAVEFORM SHAPER
DPG IN 66
DFG IN 65
RF SW
DRUM PHASE CTL
DRUM SPEED CTL
SYNC SEP 50 C SYNC

H.A.SW ROTARY
AF SW
DUMMY V

24 V LOCK P
99 H AMP SW
98 ROTARY
20 MC FR
23 RF SWP
30 AF SWP

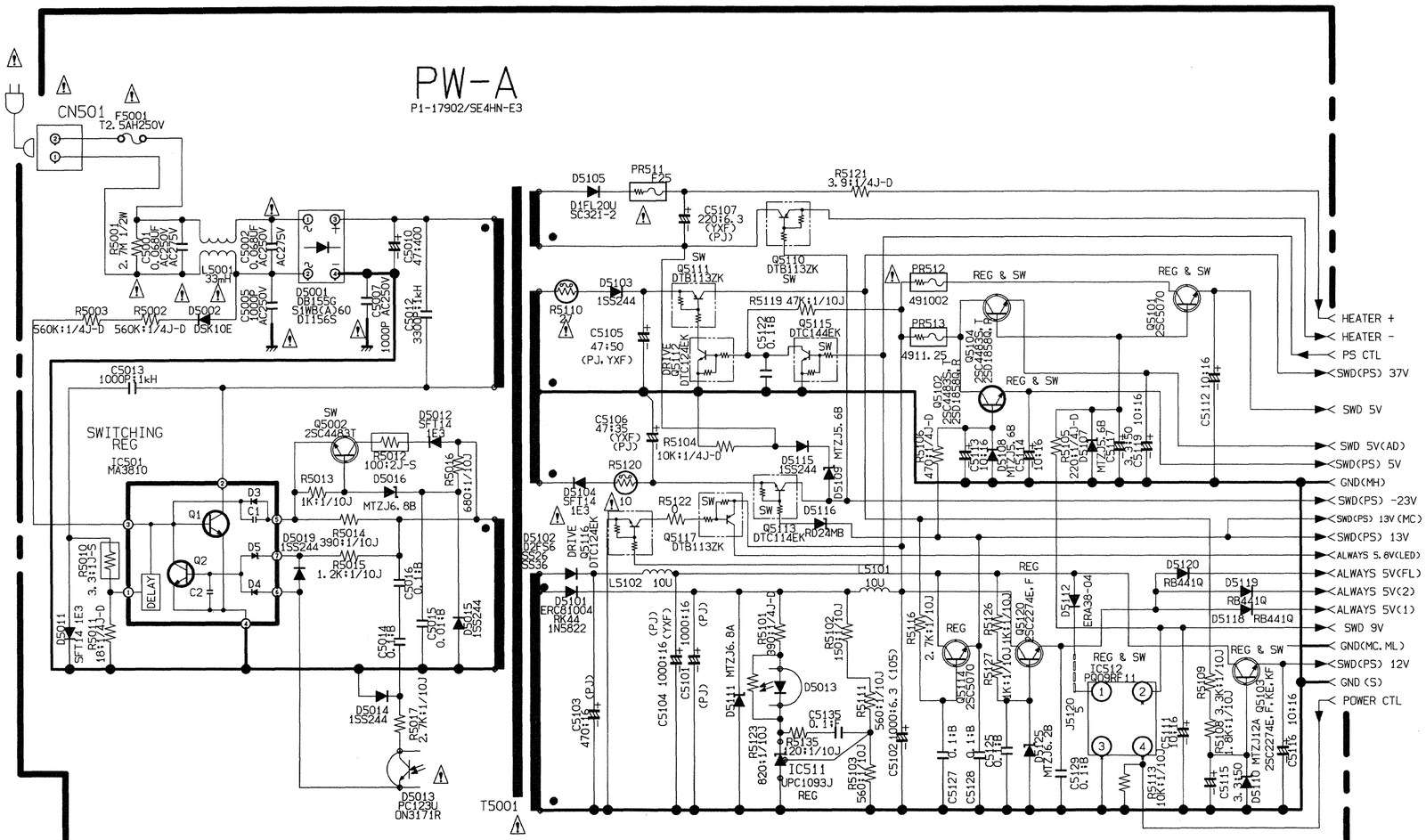
33 L.P.F D/A CONVERTER
34 L.P.F D/A CONVERTER

VD (TO MCOM)
ENV DET
H AMP SW
V LOCK P
ENV SW
ROTARY
→ TO VA-A
RF SWP
AF ENV
AF SWP
→ TO AD-A

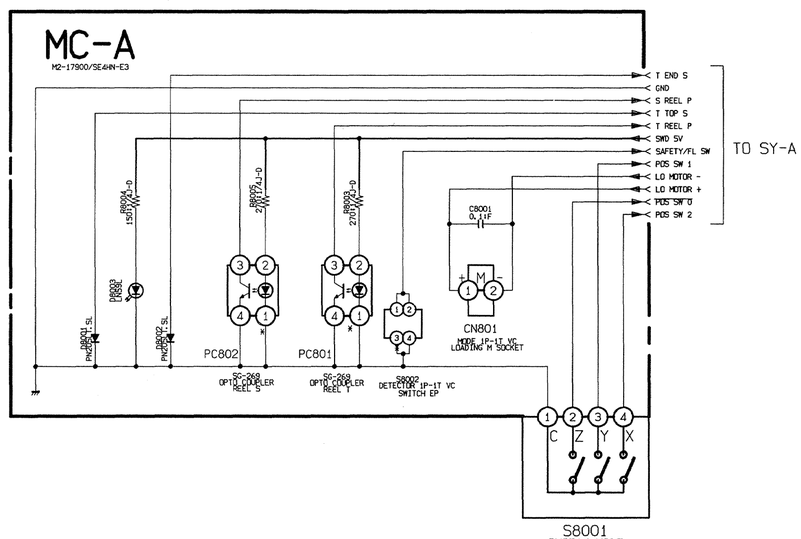
CTL HEAD: CTL-, CTL+
MC-FR
C-FG
CAPSTAN MOTOR
MECHANISM
D-FG
D-PG
HEAD DRUM MOTOR

BDS1-17900/SE4HN-E3

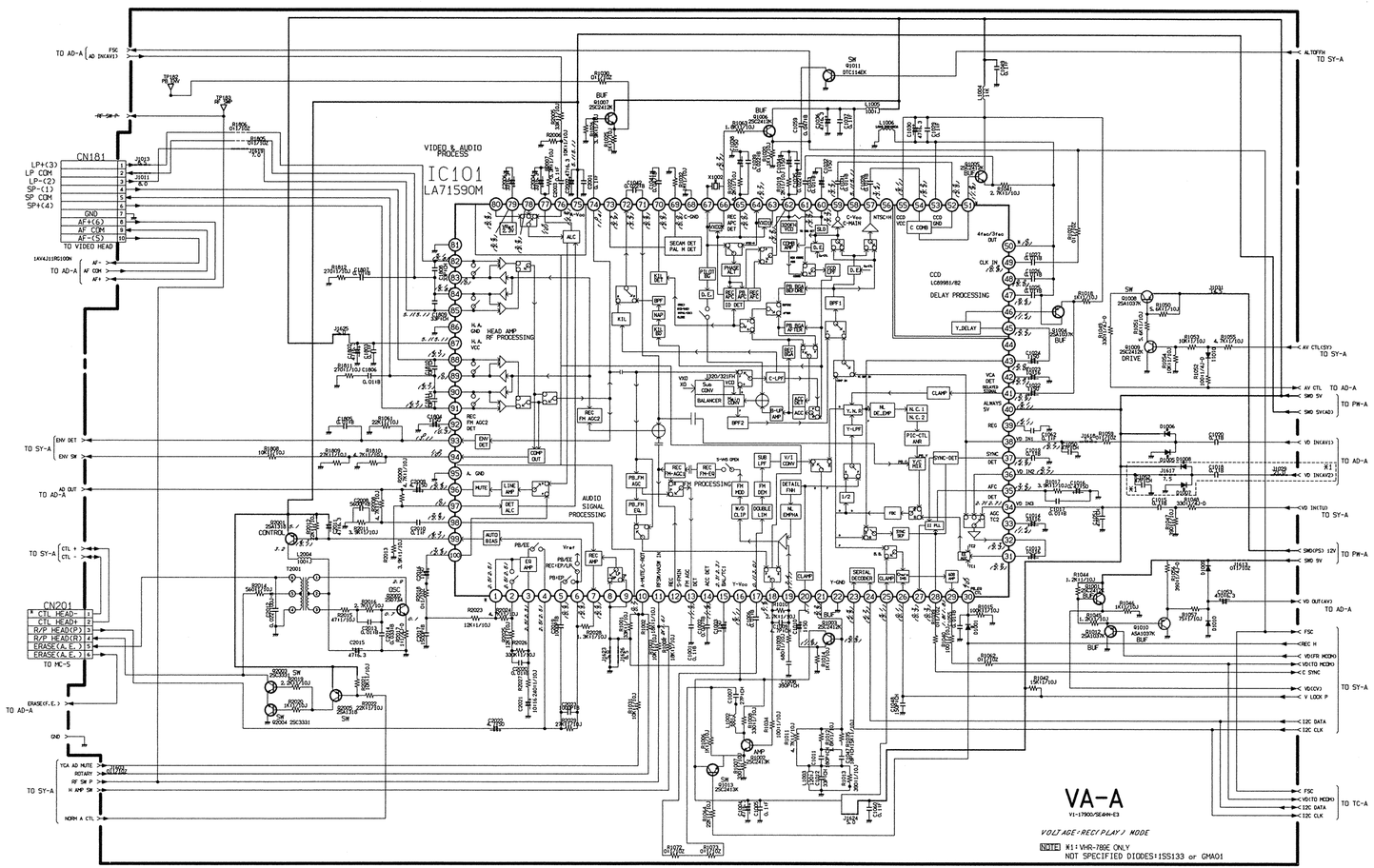
CP-1 BOARD (PW-A) POWER SUPPLY



CP-1 BOARD (MC-A) MECHANISM SENSOR



CP-1 BOARD (VA-A) VIDEO & AUDIO

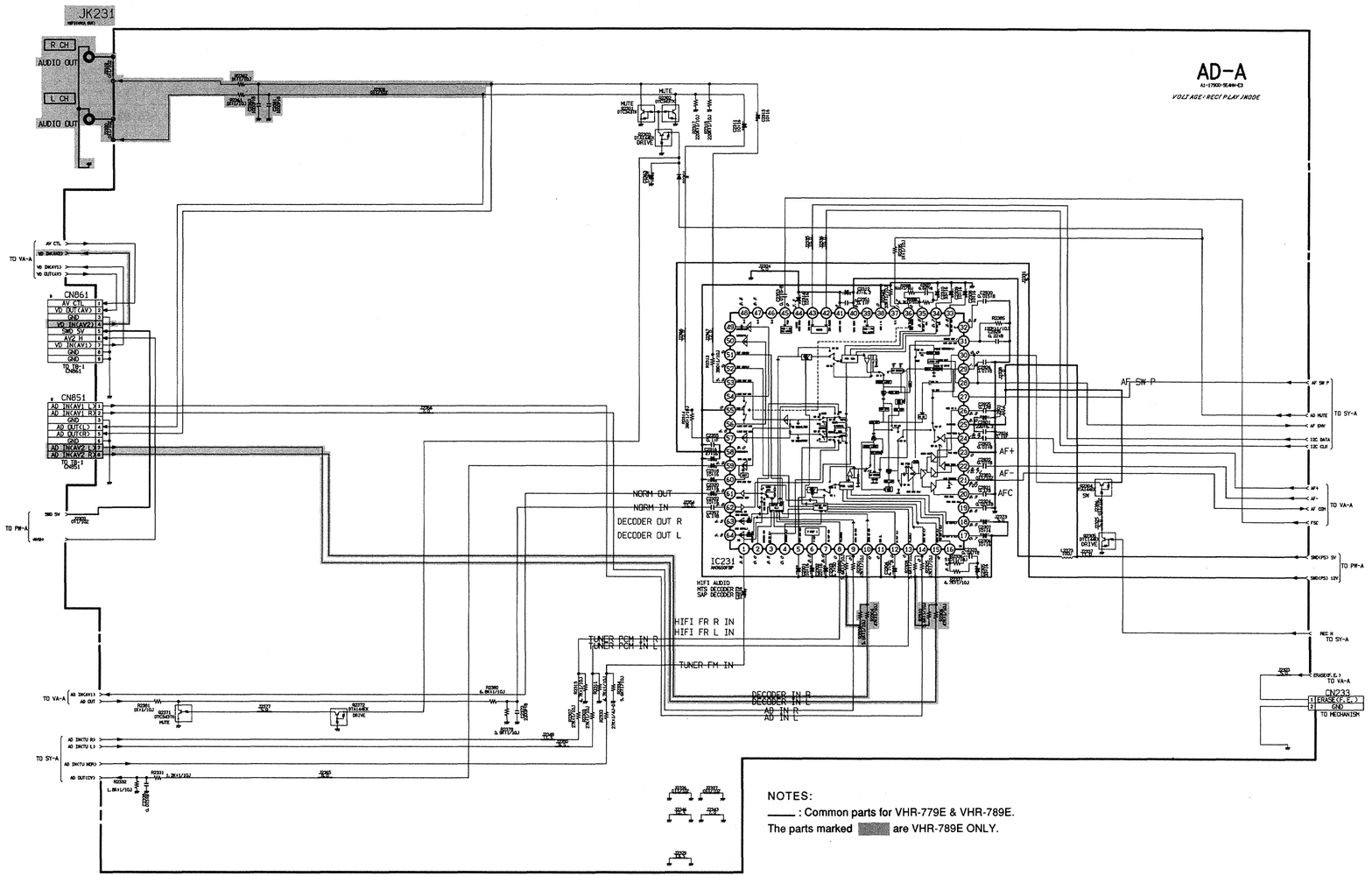


VIDEO CIRCUIT WAVEFORMS

TEST LOCATION	WAVE FORM	TEST LOCATION	WAVE FORM
IC101 PIN17 PLAY 100mV/500ns/div		IC101 PIN43,45 REC/PLAY 100mV/20µs/div	
IC101 PIN20,21 REC/PLAY 100mV/20µs/div		IC101 PIN57,59 REC/PLAY 100mV/20µs/div	
IC101 PIN26 STILL 2V/200µs/div		IC101 PIN51,61 REC/PLAY 100mV/20µs/div	
IC101 PIN28 REC/PLAY 1V/20µs/div		IC101 PIN71,72 REC 100mV/20µs/div	
IC101 PIN29 REC/PLAY 500mV/20µs/div		IC101 PIN71,72 PLAY 100mV/20µs/div	
IC101 PIN34,36,38 REC 200mV/20µs/div		IC101 PIN90 REC 1V/200ns/div	
IC101 PIN41,46 REC/PLAY 100mV/20µs/div			

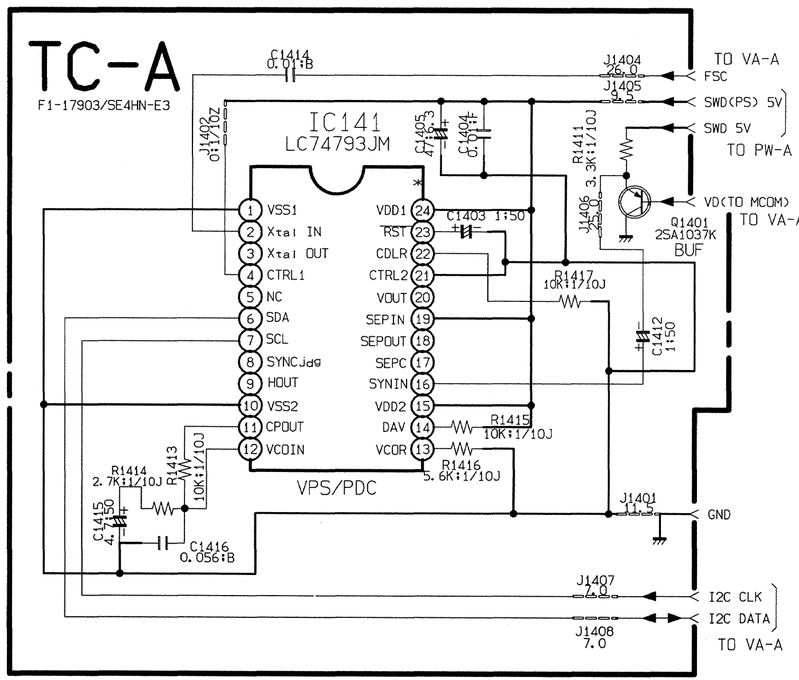
WF_V_SE4

CP-1 BOARD (AD-A) HiFi AUDIO

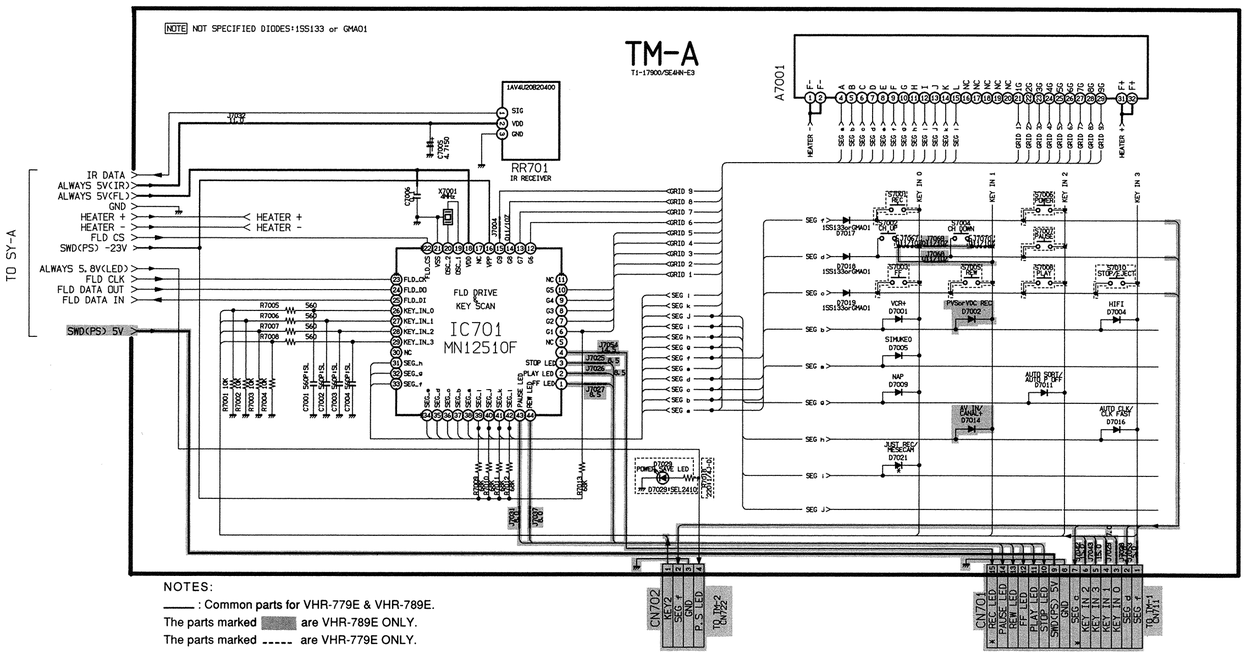


NOTES:
——— : Common parts for VHR-779E & VHR-789E.
The parts marked ▬ are VHR-789E ONLY.

CP-1 BOARD (TC-A) VPS/PDC



CP-1 BOARD (TM-A) DISPLAY (FLD) & KEY SCAN



NOTES:

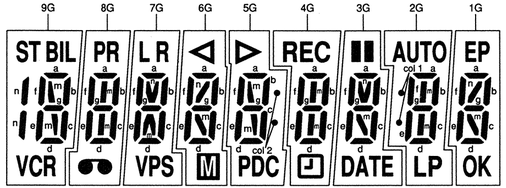
——— : Common parts for VHR-779E & VHR-789E.

The parts marked ▒▒▒ are VHR-789E ONLY.

The parts marked - - - - - are VHR-779E ONLY.

A7001 DISPLAY (FLD) GRID/ANODE ASSIGNMENT DRAWING & TABLE

GRID & SEGMENT ASSIGNMENT

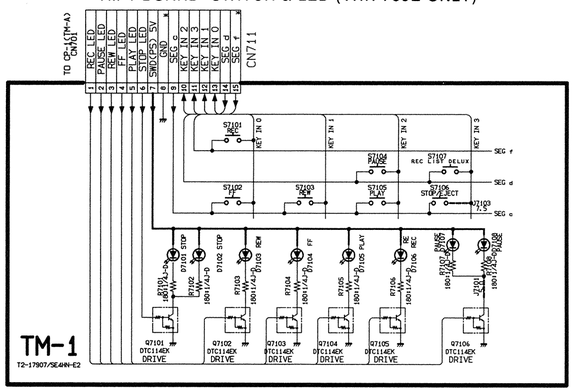


ANODE CONNECTION

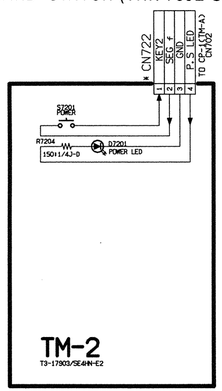
GRID / SEGMENT	9G	8G	7G	6G	5G	4G	3G	2G	1G
a	ST	PR	L	◁	▷	REC	▮▮	AUTO	EP
b	n	—	n	n	—	—	n	—	n
c	a	a	a	a	a	a	a	a	a
d	b	b	b	b	b	b	b	b	b
e	c	c	c	c	c	c	c	c	c
f	d	d	d	d	d	d	d	d	d
g	e	e	e	e	e	e	e	e	e
h	f	f	f	f	f	f	f	f	f
i	g	g	g	g	g	g	g	g	g
j	m	m	m	m	m	m	m	m	m
k	BIL	—	VPS	—	col 2	—	—	col 1	—
l	VCR	●●	R	M	PDC	⏎	DATE	LP	OK

GR-00800

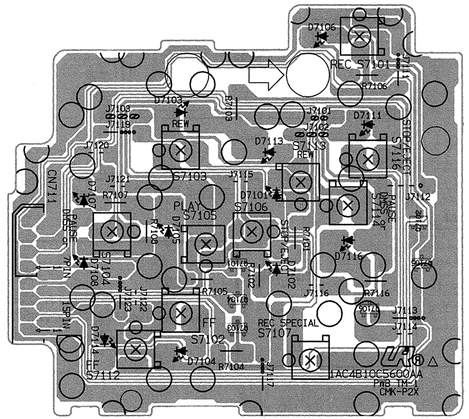
TM-1 BOARD SWITCH & LED (VHR-789E ONLY)



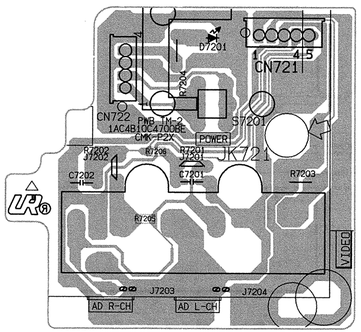
TM-2 BOARD SWITCH (VHR-789E ONLY)



TM-1 P.W.B. (VHR-789E ONLY)



TM-2 P.W.B. (VHR-789E ONLY)



IC301 SYSTEM CONTROL,TIMER,TUNING CONTROL,OSC & SERVO MPU PIN FUCTIONS

No.	Name	I/O	H/L	Signal Function
1	GND	-	-	Ground terminal
2	OPEN	-	-	-
3	T REEL P	I	-	Pulse signal from take up reel moving sensor.
4	S REEL P	I	-	Pulse signal from supply up reel moving sensor.
5	REMOCON IN	I	-	Remote control signal input.
6	ML-D	O	-	Loading motor rotation indication signal. (Load "H", Brake "M", Unload "L")
7	ML-S	O	-	Loading motor rotation speed indication signal. (High "H", Middle "M", Low "L")
8	FLSTART + SAFETY	I	L	Switch input indicating start of cassette loading or discharge by cassette mechanism and detecting accidental erasure prevention tab of cassette tape.
9	SW0	I	-	Data indicating operation position of mechanism.
10	POWER UP	O	H	High output except when power is off.
11	SW1	I	-	Data indicating operation position of mechanism.
12	SW2	I	-	Data indicating operation position of mechanism.
13	REMOCON OUT	-	-	-
14	FLD SCLK	O	-	Clock pulse for FLD display drive IC.
15	FLD SDIN	I	-	Data signal input from FLD display drive IC.
16	FLD SDOT	O	-	Data signal output to FLD display drive IC.
17	I2C DAT	O	-	Control signal output to tuner, video-audio and HiFi audio IC.
18	I2C CLK	O	-	Clock signal output to tuner, video-audio and HiFi audio IC.
19	N.C.	-	-	-
20	MC F/R	O	-	Capstan motor rotation (normal/reverse) indication signal. (reverse H)
21	CM SKIP P	O	-	-
22	TU AD MUTE	O	H	Signal disable tuner audio signal output.
23	RF SW P	O	-	RF switching pulse created by head drum PG.
24	QVD	O	-	Quasi vertical synchronizing signal.
25	RESET	I	L	Initial reset terminal for this IC.
26	CM SKIP IN	I	-	-
27	FLD CS	O	H	Chip select signal to FLD display drive IC.
28	TU C-SYNC	I	-	Composite synchronizing signal input.
29	CLK ADJ	-	-	-
30	AF SW P	O	-	AF switching pulse created by head drum PG.
31	N.C.	-	-	-
32	N.C.	-	-	-
33	MC-PWM	O	-	Output of capstan motor servo control signal. (PWM signal)
34	MH-PWM	O	-	Output of head drum motor servo control signal. (PWM signal)
35	Q SOUND H	O	H	Signal to indicate "Q sound" is on.
36	VDD	-	-	Back up 5V
37	OSCO	O	-	IC clock OSC terminal.
38	OSCI	I	-	14.318MHz
39	VSS	-	-	Ground terminal
40	XI	I	-	IC timer clock OSC terminal.
41	XO	O		32.768KHz
42	VDD	-	-	-
43	V STEREO H	-	-	-
44	PB-L	O	L	Signal for indicating playback mode.
45	Q SOUND SUPER	O	H	Signal for indicating "Q sound" effect is strong.
46	N.C.	-	-	-
47	VD OUT	O	-	Video output signal from on screen display circuit.
48	VSS2	-	-	Ground terminal.
49	VD IN	I		Video input signal to on screen display circuit.
50	VD IN FILTER	I		Video input signal to on screen display circuit and servo circuit.

No.	Name	I/O	H/L	Signal Function
51	VDD2	-	-	Always 5V
52	AFCC	-	-	-
53	AFCLPF	-	-	-
54	N.C.	-	-	-
55	N.C.	-	-	-
56	TN CLK	O	-	Clock signal to control MTS and NICAM decoder.
57	TN DATA	O	-	Data signal to control MTS and NICAM decoder.
58	VSC DATA	O	-	Data to VSC(DMSS) control.
59	VSC CLK	O	-	Clock to VSC(DMSS) control.
60	REC H	O	H	Signal to indicate recording mode.
61	VD MUTE	O	H	Signal disable video signal output.
62	YCA MUTE	O	L	Signal disable video or audio signal output.
63	ALT OFF H.	O	H	Signal to switch the time-constant of APC circuit while special play mode.
64	GND	-	-	Ground
65	DFG SIG IN	I	-	Head drum FG pulse input.
66	PG SIG IN	I	-	Head drum PG(phase) pulse input.
67	FG OUT	O	-	Head drum FG amp output.
68	CFG SIG IN	O	-	Capstan FG pulse input.
69	AMP BIAS	O	-	Bias voltage for DFG amp.
70	VRI	O	-	-
71	AVSS	-	-	Ground terminal.
72	CTLA	-	-	-
73	AVDD	O	-	Always 5V.
74	CTL+	I/O	-	Control pulse I/O.
75	CTL-	I/O	-	Control pulse I/O.
76	CO	-	-	-
77	ROM OP	-	-	-
78	AD MUTE	O	H	Signal disable audio signal output.
79	N.C.	-	-	-
80	POWER DOWN	I	L	Power failure detection circuit.
81	N.C.	-	-	-
82	N.C.	-	-	-
83	AFT C	I	-	Tuner AFT S-curve signal for tuner AFT control.
84	AF ENV	I	-	HiFi audio head envelope detection signal input.
85	VD ENV	I	-	Video head envelope detection signal input for ATR function.
86	TU SW2	O	-	Detect the system of RF out. (PALI H)
87	TU SW1	O	-	Detect the system of RF out. (PALDK H)
88	T TOP S	I	L	Sensor signal input for tape beginning detection.
89	T END S	I	L	Sensor signal input for tape end detection.
90	N.C.	-	-	-
91	NORM A CTL	O	-	H during normal audio recording.
92	N.C.	-	-	-
93	N.C.	-	-	-
94	N.C.	-	-	-
95	N.C.	-	-	-
96	AVCTL (SY)	O	H	AV control signal output.
97	PS CTL	O	-	Power save control signal output.
98	ROTARY	O	-	Video head CH1/CH2 confirmation signal. Usad in the processing of image circuit color signals.
99	H AMP SW	O	-	Main head and sub head switching signal.
100	ENV SW	I	-	Input comparationie signal for main head and sub head.

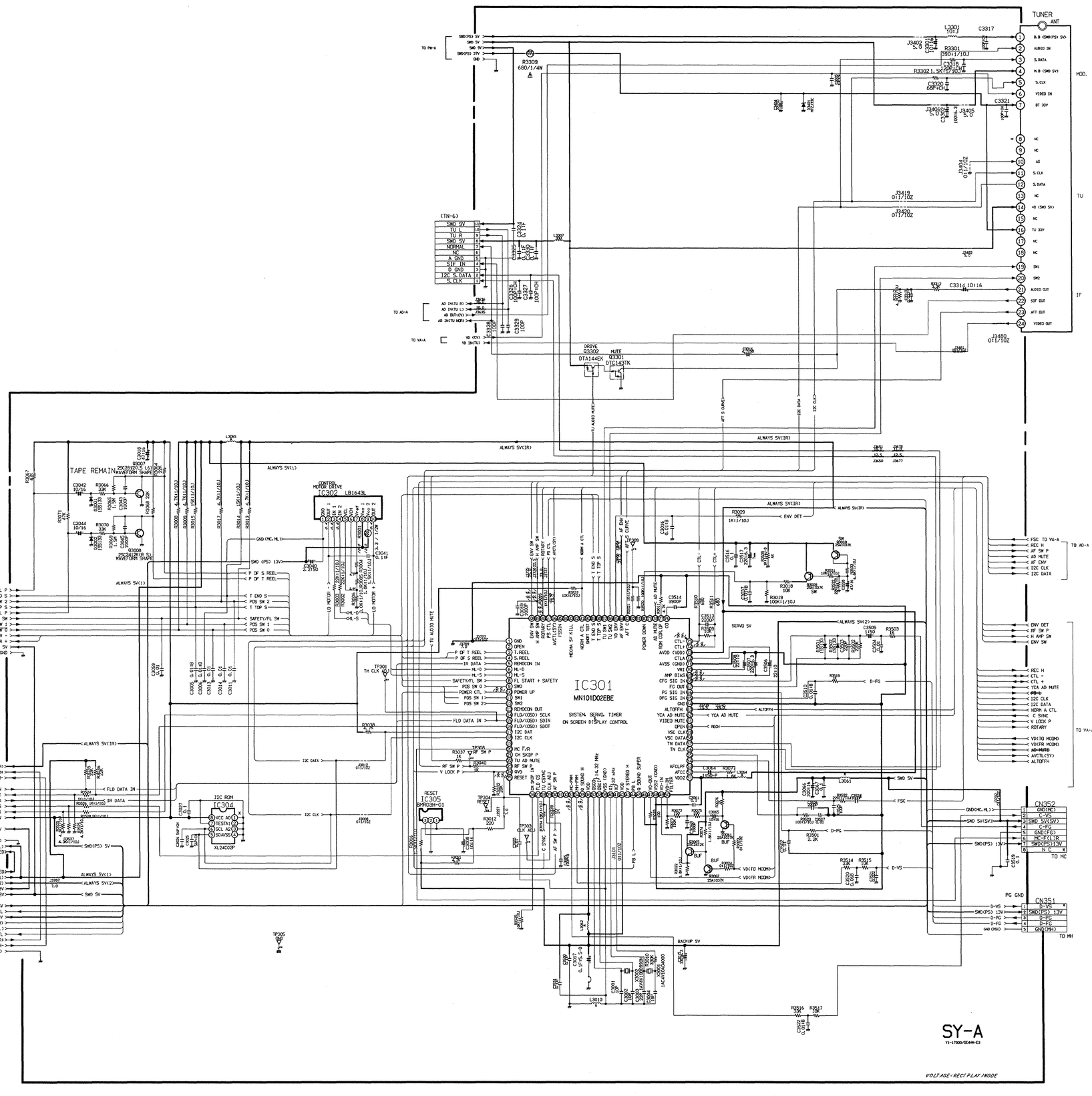
SE4HN_IC301

SERVO CIRCUIT WAVEFORMS

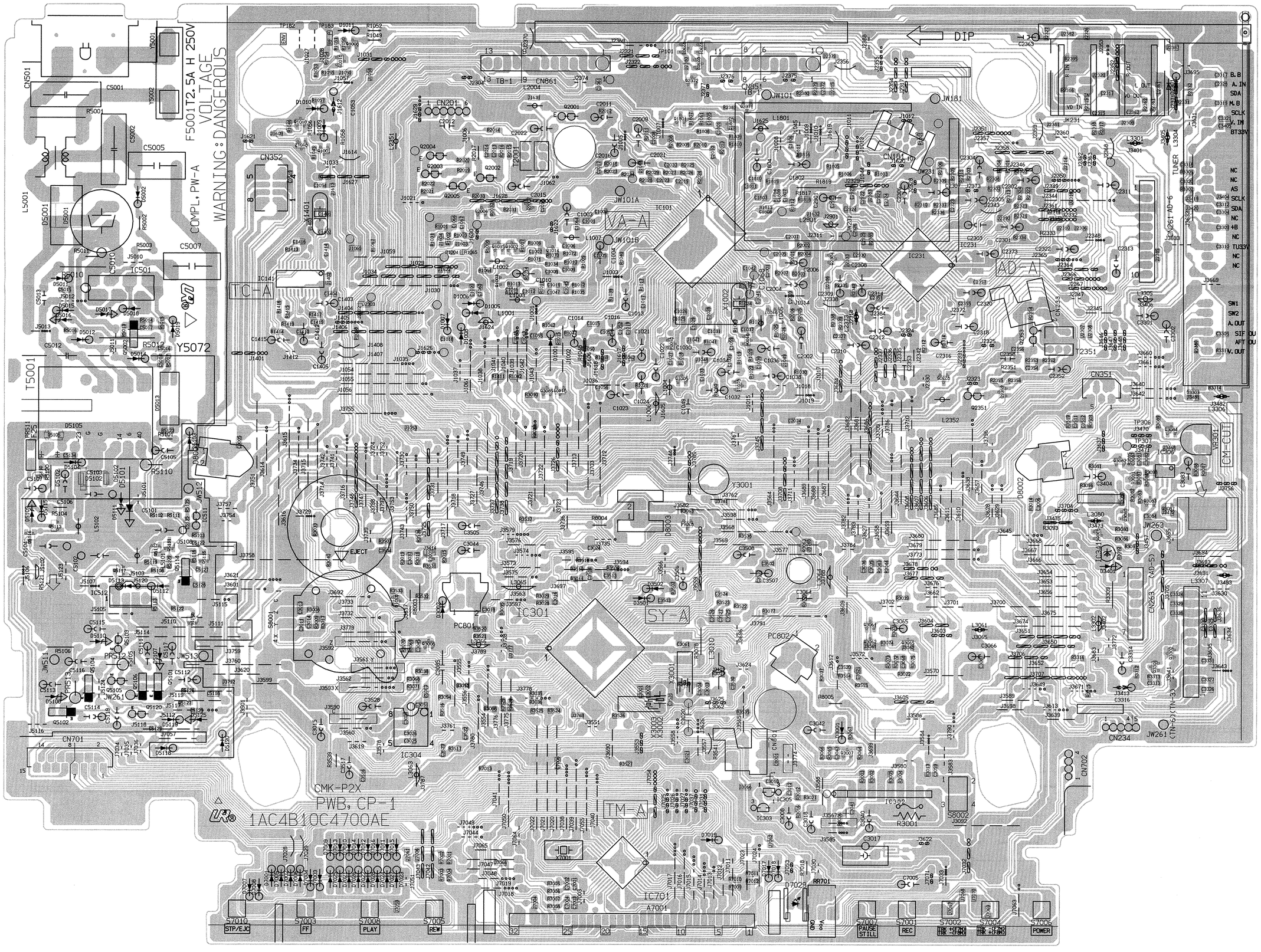
TEST LOCATION	WAVEFORM	TEST LOCATION	WAVEFORM
IC301 PIN 23 REC/PB RF SWP 2V/div. 10ms/div.		IC301 PIN 65 REC/PB DFG 500mV/div. 500μs/div.	
IC301 PIN 24 STILL 2V/div. 10ms/div.		IC301 PIN 66 REC/PB DPG 100mV/div. 10ms/div.	
IC301 PIN 24 STILL V LOCK 2V/div. 200μs/div.		IC301 PIN 67 REC/PB CFG OUT 200mV/div. 500μs/div.	
IC301 PIN 28 REC/PB C-SYNC 2V/div. 20μs/div.		IC301 PIN 74 REC CTL+ 1V/div. 20ms/div.	
IC301 PIN 33,34 REC/PB 2V/div. 5μs/div.			

WF-S-AF4H-Z

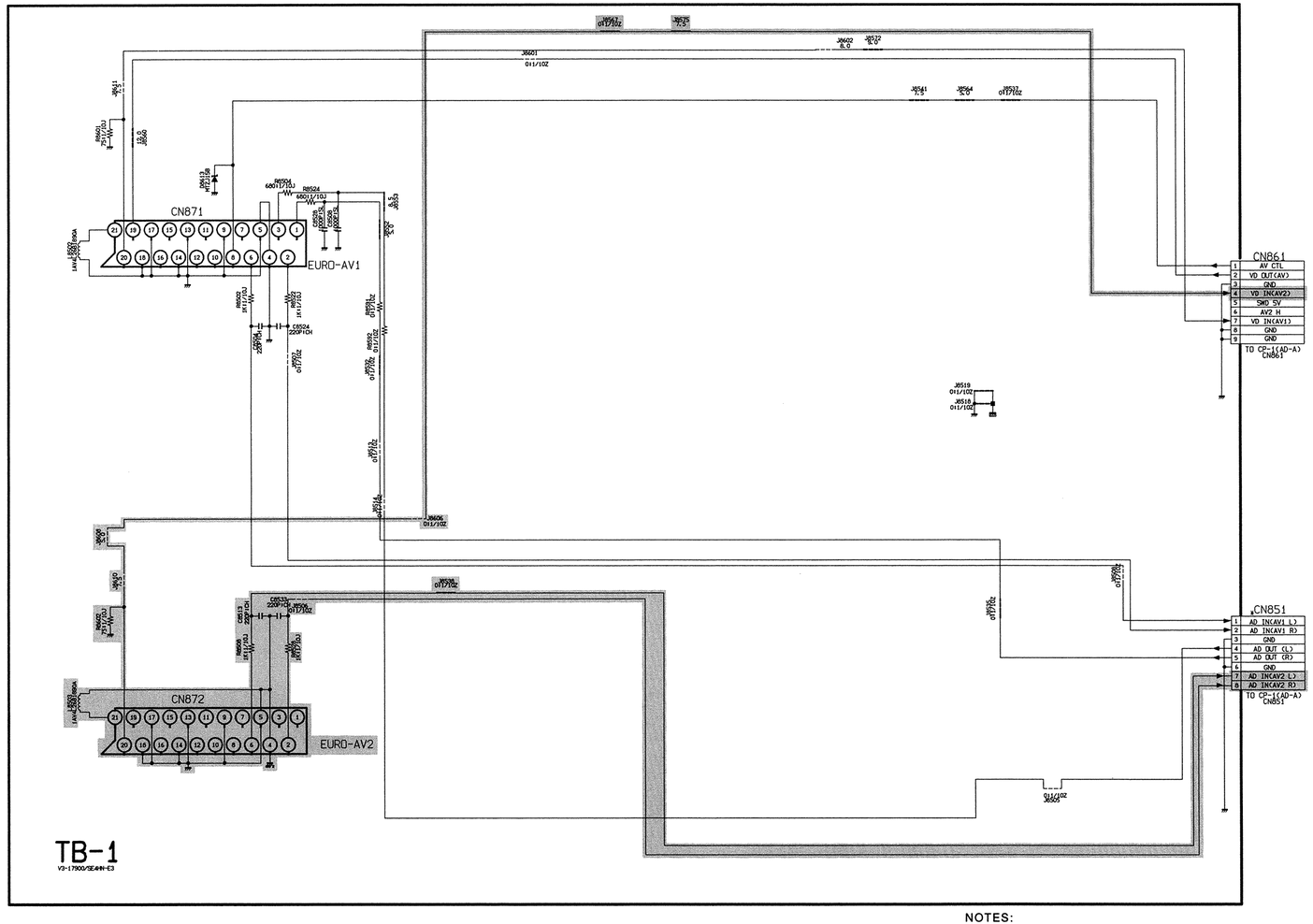
CP-1 BOARD (SY-A) SYSTEM CONTROL, TIMER, TUNER, OSC & SERVO



CP-1 P.W.B.


F5001T2.5A H 250V
VOLTAGE
WARNING:DANGEROUS
COMPL.PW-A
CMK-P2X
PWB, CP-1
1AC4B10C4700AE
TC-A
IC-A
MA-A
SY-A
IM-A
AD-A
CM-CUT
CA0-53
CTN-53
DIP
TUNER
EJECT
STP/EJC
FF
PLAY
REW
PAUSE STILL
REC
POWER

TB-1 BOARD TERMINAL

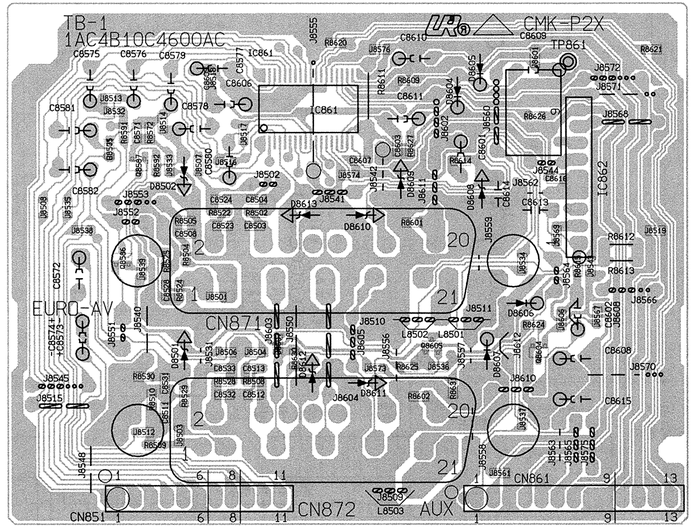


NOTES:

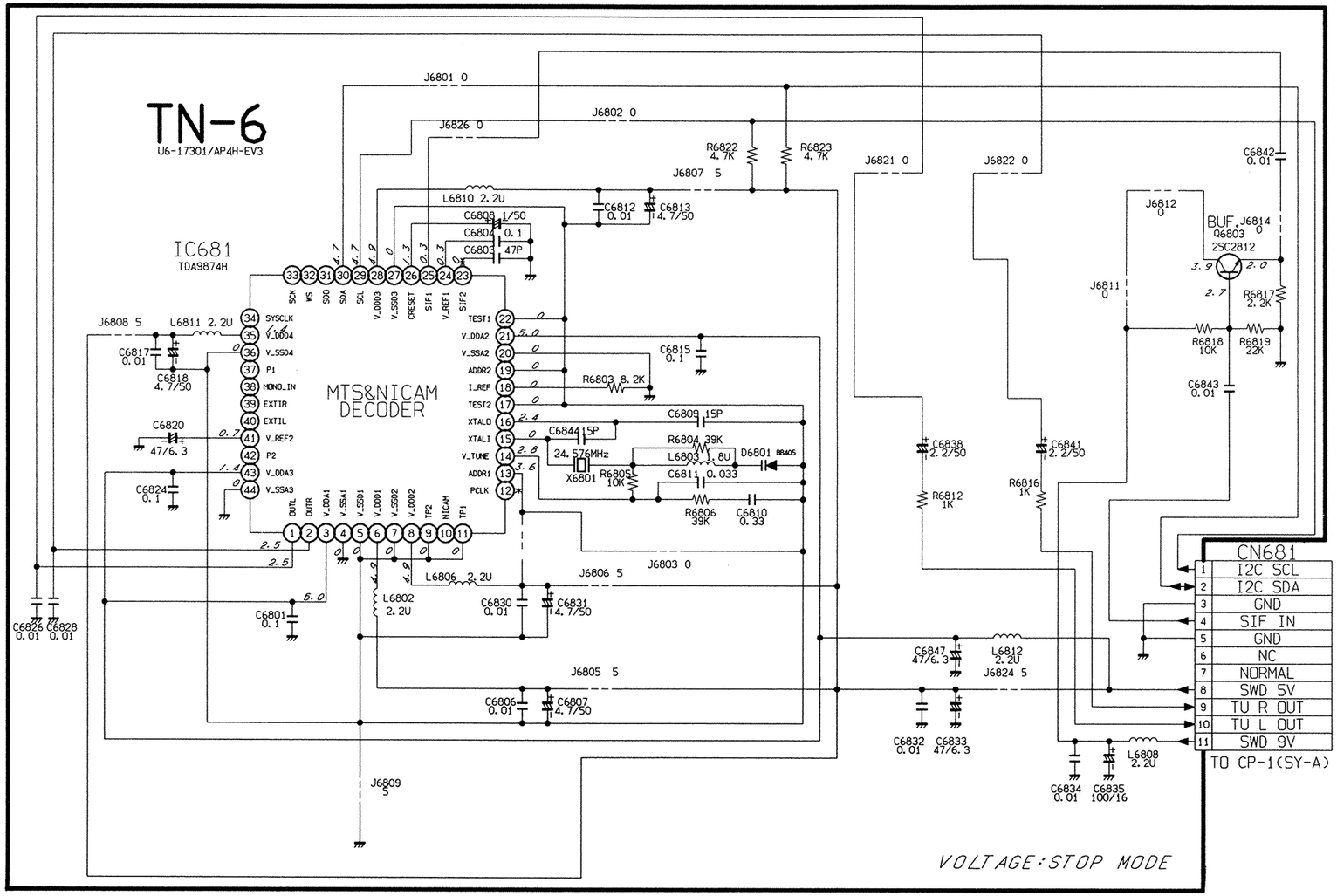
——— : Common parts for VHR-779E & VHR-789E.

The parts marked ▒▒▒ are VHR-789E ONLY.

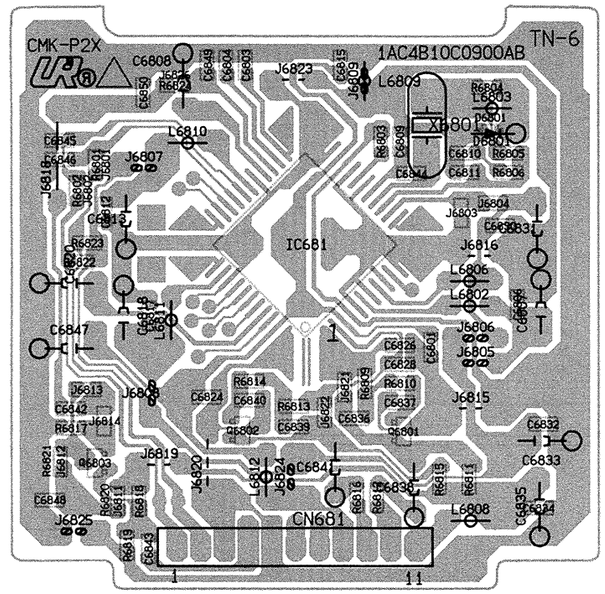
TB-1 P.W.B.



TN-6 BOARD MTS & NICAM DECODER



TN-6 P.W.B.



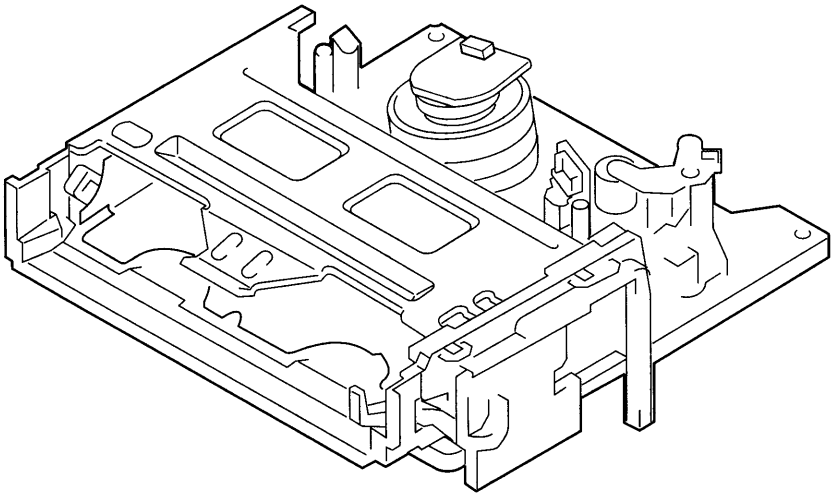
FILE NO.

SANYO

BASIC SERVICE TECHNICAL INFORMATION

Video Cassette Recorder

VC MECHANISM



VHS
PAL SECAM NTSC

Contents

1. MAINTENANCE AND INSPECTION OF MECHANISM
1-1. REGULAR CHECKS AND MAINTENANCE ITEMS 2
1-2. SERVICE TOOLS 3
1-3. CLEANING 4
2. AN OVERVIEW OF MECHANISM
2-1. NAMES OF MAIN PARTS 4
2-2. AN OVERVIEW OF MECHANISM MODES 6
3. OPERATING THE MECHANISM
3-1. SERVICE MODE 8
3-2. DRIVING THE LOADING MOTOR ("assy,motor loading bb vc")BY SUPPLYING DC VOLTAGE 9
3-3. OPERATING THE MECHANISM MANUALLY 9
4. DISASSEMBLING THE MAIN PARTS OF THE MECHANISM
4-1. MECHANISM UNIT 10
4-2. CASSETTE MECHANISM 11
4-3. COMPL LEVER CLEANER 14
4-4. CYLINDER (DRUM) 15
4-5. LEVER EP SW VC 16
4-6. HEAD ERASE FULL VC 17
4-7. ASSY HEAD R/P ACE VC 17
4-8. PINCH ROLLER DRIVING SECTION AND ASSY LEVER LOAD VC 18
4-9. CAPSTAN MOTOR 19
4-10. GEAR LOCK VC, GEAR WHEEL 1/2, CAM MAIN, GEAR RELAY PINCH VC 20
4-11. LOADING MOTOR 21
4-12. ASSY LEVER BT, ASSY BRAKE BAND 22
4-13. ASSY BRAKE S/T VC, COMPL MOUNTING IDLER VC 22
4-14. ASSY BRAKE SOFT T VC, TAKE-UP SIDE REEL SPINDLE VC, GEAR REEL T VC 23
4-15. SLIDE SOFT S VC, SUPPLY SIDE REEL SPINDLE VC, GEAR REEL S VC 23
4-16. ASSY PULLEY FRICTION VC, GEAR CLUTCH VC, LEVER CLUTCH VC 24
4-17. LEVER CONTROL BRAKE VC, COMPL LEVER ACT BRAKE VC 25
4-18. SLIDE CRESCENT VC 25
4-19. ASSY LEVER SPRING BT 26
4-20. GEAR LOAD S/T, ASSY LEVER LOAD S/T, MOUNTING INCL S/T GUIDE VC 26
4-21. ASSY ROLLER GUIDE 28
4-22. SPRING EARTH VC 28
4-23. SPRING GUIDE EARTH VC, GUIDE S VC 28
5. CHECKING AND ADJUSTING THE MECHANISM
5-1. CHECKING THE REEL TORQUE VALUE 29
5-2. ADJUSTING THE ASSY LEVER BT POSITION AND CHECKING THE BACK TENSION TORQUE DURING PLAY 30
5-3. ADJUSTING TAPE PATH 30

REFERENCE No.MM531683

1. MAINTENANCE AND INSPECTION OF MECHANISM

1-1. REGULAR CHECKS AND MAINTENANCE ITEMS

To obtain full function and maximum performance from the set, and to stop it getting dirty or scratched, we recommend that you carry out the following maintenance procedures and regular checks. The maintenance checks described in the following section should also be carried out without fail after carrying out any repairs to the set.

NOTE: OIL AND GREASE

- Always use the specified brands of oil and grease. If you use a grease with the wrong viscosity, for example, this can lead to all sorts of problems. Be careful to keep the oil and grease free of dust and foreign bodies.
- A "drop" of oil is the amount of oil remaining on the tip of a rod with a diameter of 1.5mm after it is dipped in oil to a depth of 1cm and then taken out.

1-1-1. REGULAR CHECKS

○ Clean ◎ Check △ Oil

Part maintained \ Hours of use (H)		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	Remarks
Tape path system	Tape guide	○	○	○	○	○	○	○	○	○	○	
	Assy, head r/p ace vc	○	○	○	○	○	○	○	○	○	○	
	Compl, cylinder XXXX (Assy, cylinder, upr XXXX)	○	○ (◎)	○ (◎)	○ (◎)	○ (◎)	○ (◎)	○ (◎)	○ (◎)	○ (◎)	○ (◎)	The life of parts varies enormously, depending on the environment in which the part is used.
	Assy, mounting cleaner		◎		◎		◎		◎		◎	
	Assy, lever, pinch vc	○	○	○	○	○	○	○	○	○	○	
Drive system	Reel, spindle vc		○		○△		○		○△		○	
	Belt, reel vc	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
	Relay gear, Pulley shaft, Gear shaft		△		△		△		△		△	
	Assy, motor loading bb vc		◎		◎		◎		◎		◎	
Perform-ance checks	Back tension		◎		◎		◎		◎		◎	Playback tension torque: 30 to 50g/cm
	Brake system		◎		◎		◎		◎		◎	
	FWD, REW, PLAY torque, REV (R-SEARCH) torque		◎		◎		◎		◎		◎	FWD: 650g/cm or over REW: 650g/cm or over PLAY (SP mode): 60 to 110g/cm REV (R-SEARCH): 115 to 180g/cm

Note: The XXXX of the "compl, cylinder, XXXX" display differs according to the model.

1-2. SERVICE TOOLS

1-2-1. SERVICE TOOLS

NOTES ON ALIGNMENT TAPES

Select a PAL or NTSC alignment tape from the list below, according to the transmission system of the VCR you are repairing.
PAL: For models with 625 scanning lines and a field frequency of 50Hz
NTSC: For models with 525 scanning lines and a field frequency of 60Hz

No.	Tool	Tool No.		Remarks
		NTSC	PAL	
1	Alignment tape	VHJ-0005	VHJ-0008	SP colour bar 1kHz (normal)
2	Alignment tape	VHJ-0006	VHJ-0009	SP monoscope 7kHz or 6kHz (normal)
3	Alignment tape	VHJ-0007	———	EP monoscope
4	Alignment tape	———	VHJ-0052	LP monoscope
5	Eccentric screw driver	VHJ-0003		Used to adjust the tape path
6	Torque dial gauge	VHJ-0004		Used to measure reel winding torque
7	Cassette torque meter	VHJ-0016		Used to measure back tension torque
8	Torque gauge screwdriver	VHJ-0014		Used to adjust the tightening torque of screws (2.3 mm dia. bit)
9	3 mm dia. bit for torque screw driver	VHJ-0045		Used to replace the bit of the torque gauge screwdriver
10	Upper drum fitting tool kit (includes VHJ-0113)	VHJ-0112		Used to reassemble the upper cylinder
11	Hexagonal wrench	VHJ-0113		Spare hexagonal wrench for upper drum fitting tool kit
12	Oil	VHJ-0099		
13	Grease	VHJ-0100		
14	Grease	VHJ-0114		
15	Grease	VHJ-0115		

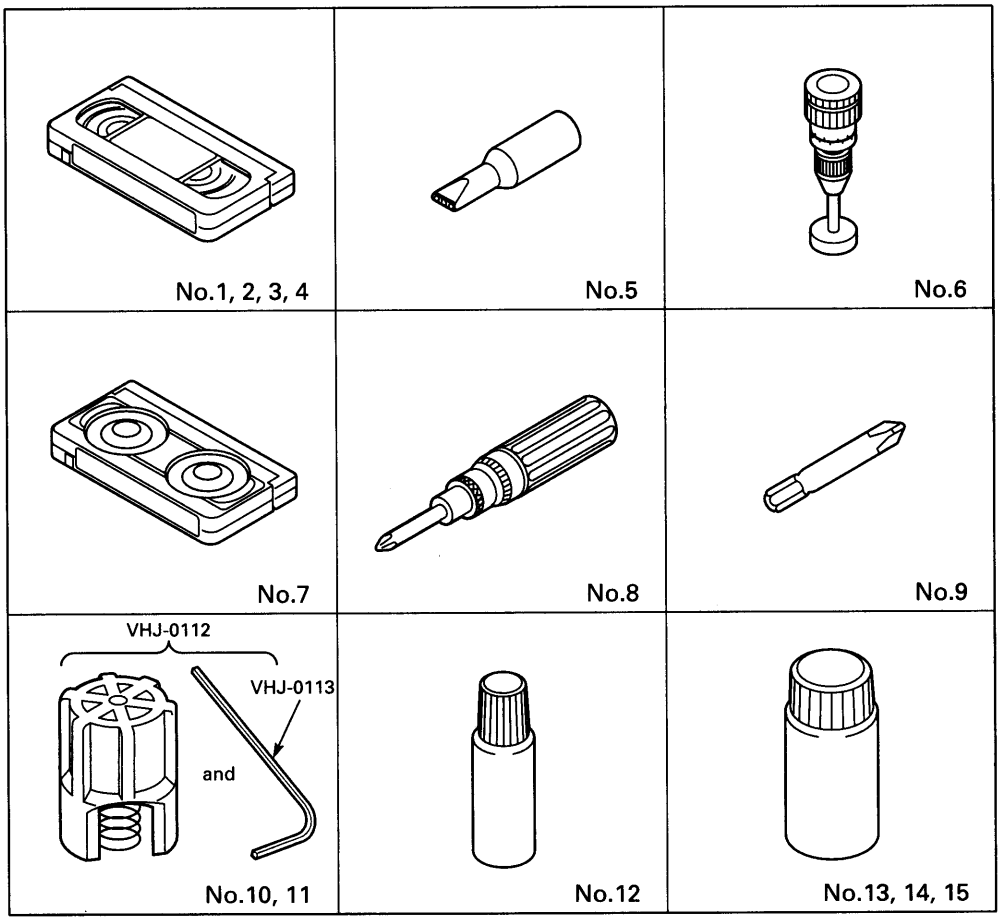


Fig. 1-2-1

1-3. CLEANING

1-3-1. CLEANING THE CYLINDER (DRUM) (Refer to Fig. 1-3-1.)

Moisten a chamois with methyl alcohol, and clean the video head. Wipe the chamois in the horizontal direction on the video head. Take note that wiping it in the vertical direction or applying excessive force may cause damage of the video head.
Clean the cylinder surface with chamois or a soft cloth soaked with methyl alcohol.

1-3-2. CLEANING THE TAPE PATH SYSTEM AND REEL DRIVING SYSTEM

Clean the pinch roller, capstan shaft, tape guides, "head, erase full vc", "assy, head r/p ace vc", "reel, spindle vc", "assy, pulley, friction vc", "belt, reel", etc. with chamois or a soft cloth soaked with methyl alcohol.

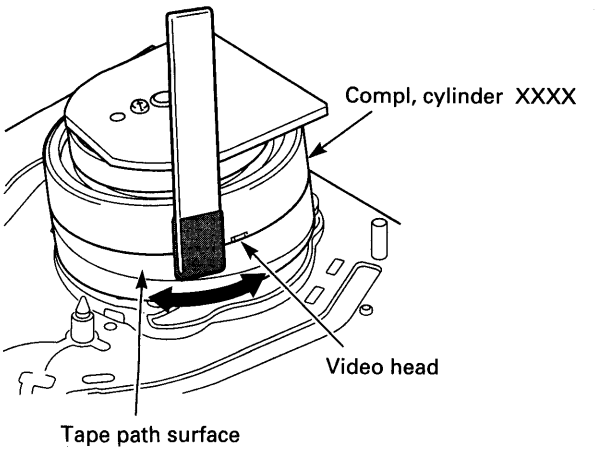


Fig. 1-3-1

2. AN OVERVIEW OF MECHANISM

2-1. NAMES OF MAIN PARTS

2-1-1. "COMPL, CASSETTE MECHA VC"

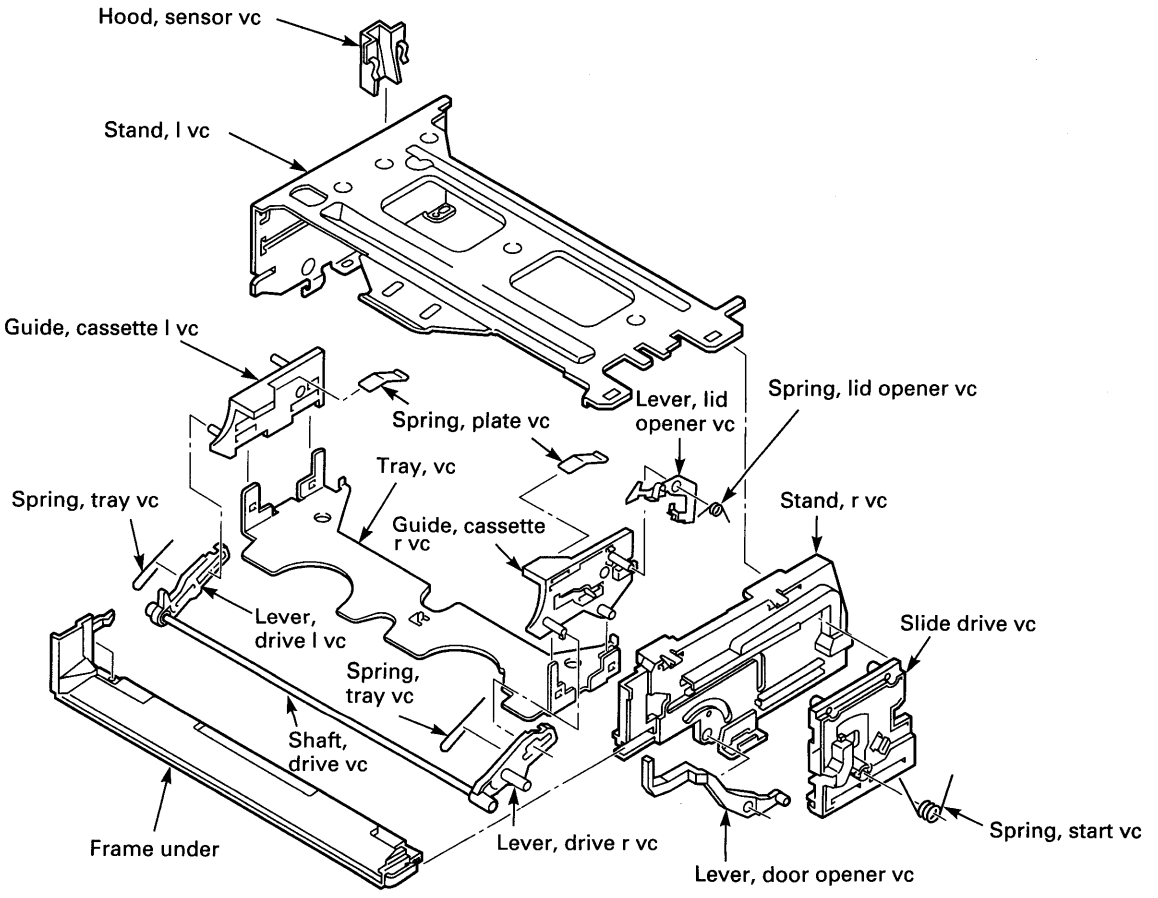


Fig. 2-1-1

2-1-2. MECHANISM CHASSIS (UPPER)

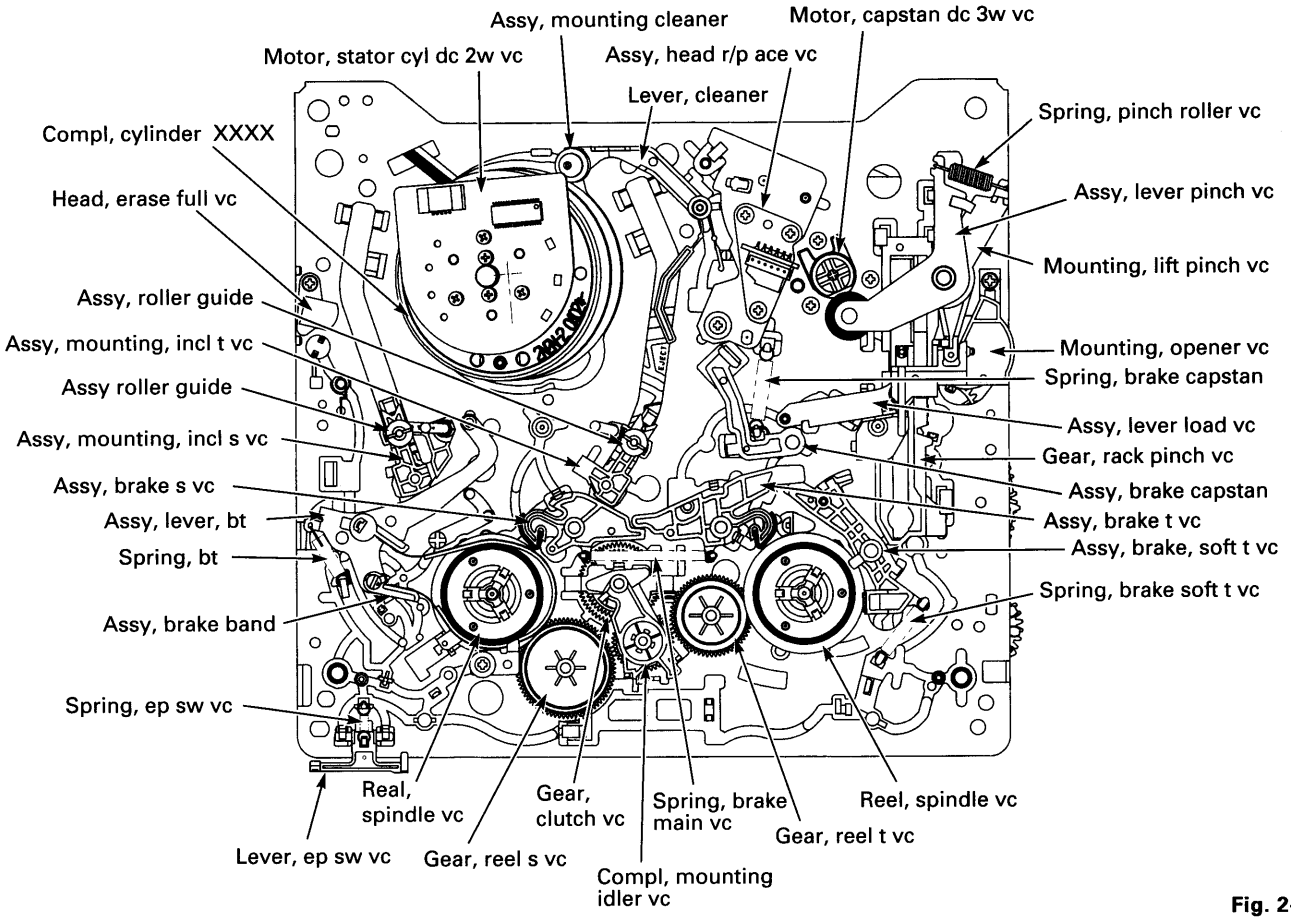


Fig. 2-1-2

2-1-3. MECHANISM CHASSIS (LOWER)

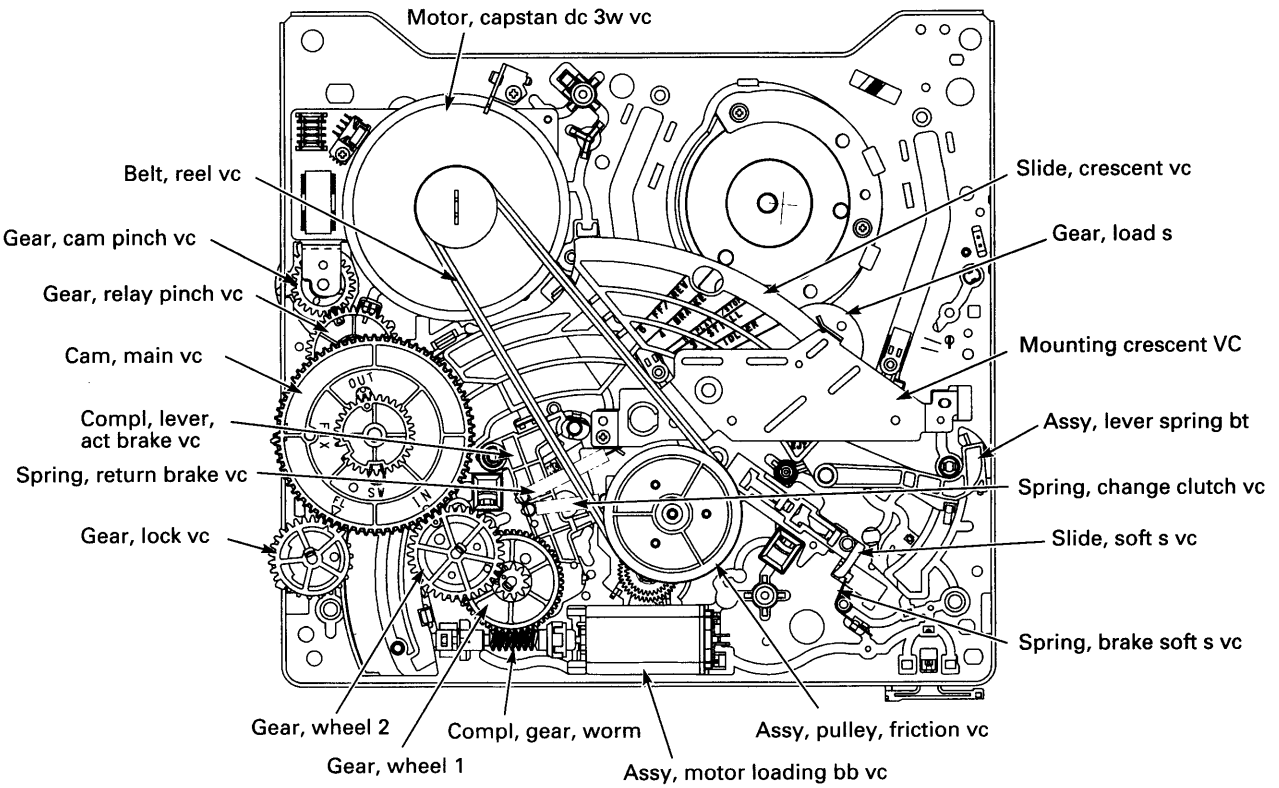


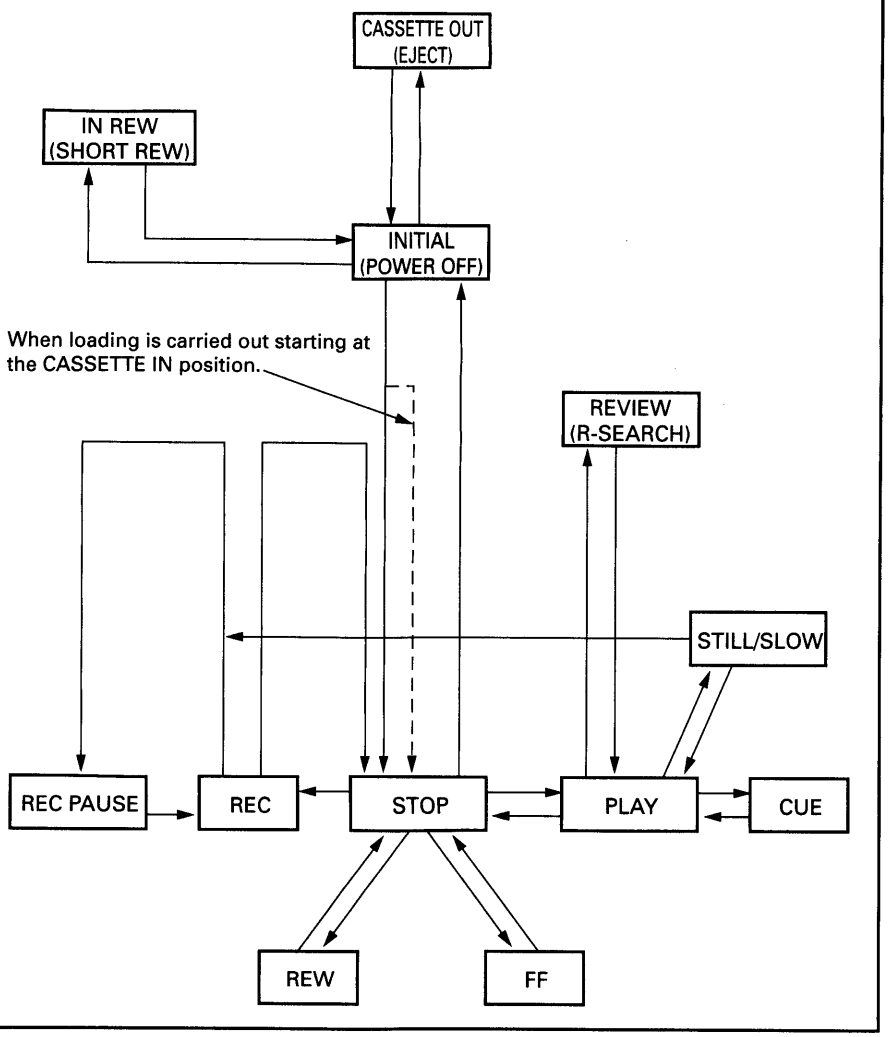
Fig. 2-1-3

2-2. AN OVERVIEW OF MECHANISM MODES

2-2-1. MECHANISM MODE SWITCHING TABLE

NOTE: The letters and figures enclosed in the mechanism mode column are the codes on the crescent slide.

HEX DATA	Mechanism mode	The principal mode-switching states of the mechanism
6	⇦ EJECT Ⓔ Distinguished by whether the EP switch is ON or OFF. Horizontal shift section. Vertical shift section.	
2		
0	⇦ IN REW	
7	⇦ INITIAL ⑦	
0	"Assy, mounting cleaner": ON "Assy, mounting incl s/t vc" pressure begins. "Assy, mounting incl s/t vc" pressure ends.	
1		
0		
1	⇦ REVIEW (R-SEARCH) ①	
0	IDLER pos. ② (Pinch roller OFF)	
2		
0		
3	⇦ STILL/SLOW ③	
0		
5	⇦ PLAY/STOP ⑤	
0		
4	BRAKE pos. ④	
0		
6	⇦ FF/REW ⑥	



MODE SWITCH OUTPUT TABLE

HEX DATA	X (POS SW 2)	Y (POS SW 1)	Z (POS SW 0)
0	H	H	H
1	H	H	L
2	H	L	H
3	H	L	L
4	L	H	H
5	L	H	L
6	L	L	H
7	L	L	L

L: Connected to C terminal (GND)
H: Not connected to C terminal (GND)

APPEARANCE OF MODE SWITCH AND RELATIONSHIP BETWEEN MODE POSITION

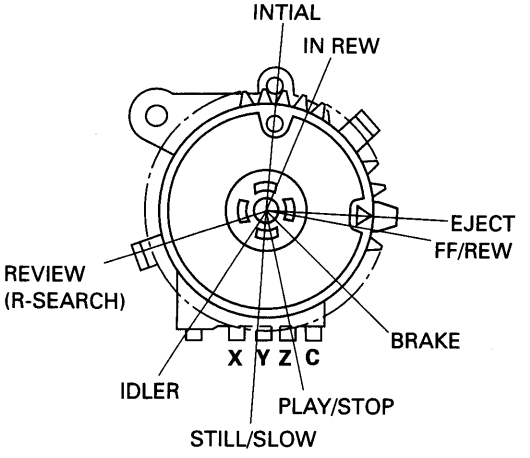


Fig. 2-2-1

2-2-2. MOVEMENT CHECK LIST FOR THE MAIN PARTS OF MECHANISM

(S): Strength (W): Weakness

No.	MECHANISM MODE / PRINCIPAL PARTS	EJECT	IN REW	INITIAL (POWER OFF)	LOADING	UNLOADING	REV (R-SEARCH)	IDLER	STILL/SLOW	PLAY/STOP	BRAKE	FF/REW
1	Assy, brake t vc	OFF	OFF	ON	ON	ON	OFF	OFF	OFF	OFF	ON	ON/OFF
2	Assy, brake s vc	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON/OFF
3	Assy, brake soft t vc	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
4	Slide soft s vc	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
5	Assy, lever, bt	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	OFF
6	Spring, bt	OFF	OFF	OFF	OFF	OFF	ON(W)	ON(W)	ON(S)	ON(S)	ON(S)	ON(W)
7	Assy, lever, pinch vc	UP	UP	UP	UP/DOWN	DOWN/UP	ON	OFF	ON	ON	OFF	OFF
8	Gear, clutch vc	PLAY	PLAY	PLAY	PLAY	PLAY	PLAY	PLAY	PLAY	PLAY	PLAY	FF
9	Assy, lever load vc	UNLO	UNLO	UNLO	LO	LO	LO	LO	LO	LO	LO	LO
10	Assy, brake capstan	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
11	Assy, mounting incl s/t vc				LO	UNLO						
12	Assy, mounting cleaner	OFF	OFF	OFF	(ON)	(ON)	OFF	OFF	OFF	OFF	OFF	OFF

2-2-3. CHECKING THE MECHANISM MODE POSITIONS

Check the mark for "slide, crescent vc" from the top and bottom sides of the mechanism to determine the appropriate mechanism mode position.
Models with display tubes which come with a service mode setting function will indicate HEX DATA on the display tube. Refer to "3-1-1. SHIFTING TO THE SERVICE MODE" for more details.

1. CHECKING FROM THE TOP SIDE OF THE MECHANISM

As shown in Fig. 2-2-2 and Fig. 2-2-3, the "slide, crescent vc" has marking lines and symbols to indicate the mechanism modes with the edge of the mechanism chassis as a reference.
The mechanism mode can be determined from the marking line for the "slide, crescent vc" which matches the reference line of the mechanism chassis. The HEX DATA can also be checked from the mechanism chassis hole.

Note:

- No HEX DATA is indicated for the EJECT mode. Instead, the hole will be empty.
- No HEX DATA is indicated for the IN REW mode because it is near the INITIAL mode and so cannot be indicated. For the same reason, there is also no marking line for the INITIAL mode.

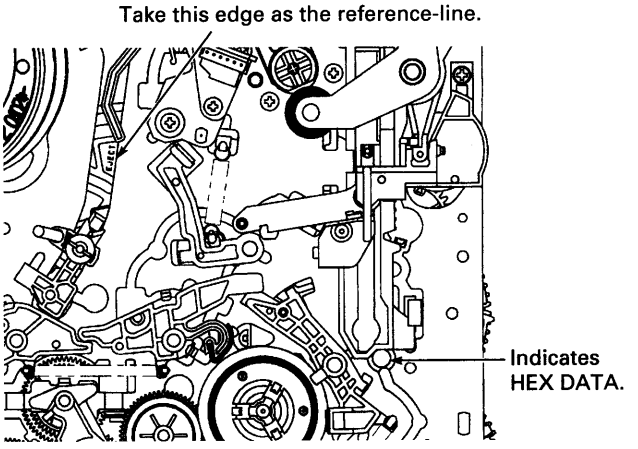


Fig. 2-2-2

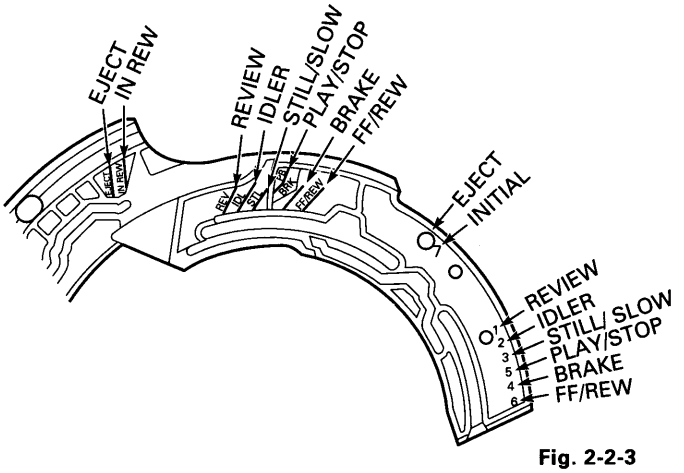


Fig. 2-2-3

2. CHECKING FROM THE BOTTOM SIDE OF THE MECHANISM

As shown in Fig. 2-2-4, the "slide, crescent vc" has marking lines and symbols to indicate the mechanism modes with the edge of the "mounting crescent vc" as a reference.

The mechanism mode can be determined from the marking line for the "slide, crescent vc" which matches the reference line of the "mounting crescent vc".

In Fig. 2-2-4, as the marking line for 6 (FF/REW) matches the reference line for the "mounting crescent vc", it indicates that the mode is the FF/REW mode.

Note:

There is no marking line for the INITIAL mode because it is near the IN REW mode and so cannot be displayed.

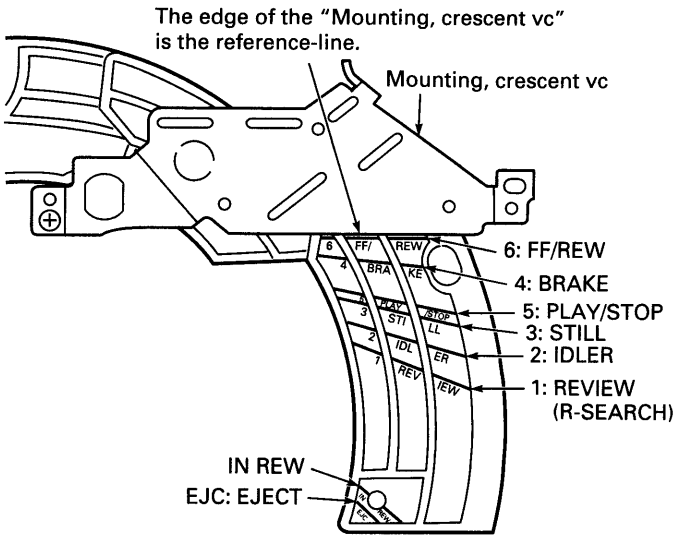


Fig. 2-2-4

2-2-4. MALFUNCTION DIAGNOSIS AND WARNING MESSAGES FOR DROP IN HEAD OUTPUT

Some models may come with a function to display malfunction diagnosis and warning messages when the head output drops.

Refer to these messages to locate the faulty conditions and cause of faults during repairs.

For details, refer to the service manuals for the respective models.

3. OPERATING THE MECHANISM

There are three methods to check mechanism operations; setting the service mode, applying DC voltage to the "assy, motor loading bb vc" directly and rotating it, rotating the "assy, motor loading bb vc" manually.

3-1. SERVICE MODE

The service mode is a special mode for services which allows mechanism operations to be checked and the cassette tape to be ejected forcibly when it cannot be removed easily during service repairs using the keys of the remote controller and main unit.

3-1-1. SHIFTING TO THE SERVICE MODE

1) With the power ON, continuously press the counter reset button of the remote controller for more than 15 seconds to set the service mode.
2) At the same time the service mode is set, the channel display on the display tube changes to a 2-digit number (HEX DATA in the mode switch output table described in 2-2-1) indicating the current mechanism mode position. (Refer to Fig. 3-1-1.)
3) The service mode can be shifted from all mechanism modes. (Excluding Power off)

   Note 1: Models with no display tubes cannot be displayed the mechanism mode, but can be shifted to the service mode.

   Note 2: The channel display position on the display tube differs according to the model.

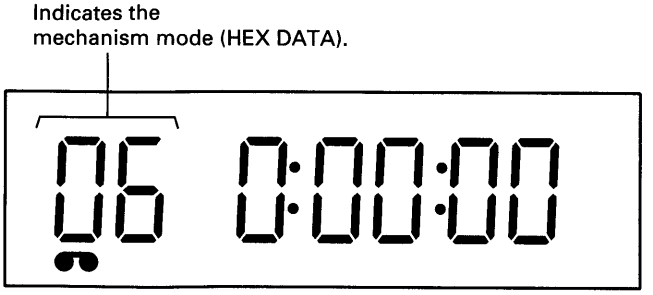


Fig. 3-1-1

3-1-2. OPERATIONS AFTER SHIFTING TO THE SERVICE MODE

1) By continuously pressing the channel button ((+) or (▲)) of the main unit or remote controller, the loading motor rotates in the loading direction, and the mode of the mechanism is shifted from the EJECT position to the FF/REW position of the final mode.
   At the same time, the mechanism mode (2-digit number) currently shifted to is displayed on the display tube in order. At this time, the drum motor ("motor, rotor cyl dc 2w vc") and capstan motor ("motor, capstan dc 3w vc") will not rotate.
2) To shift the mode of the mechanism from the FF/REW position in the unloading direction (EJECT position direction), continue pressing the channel button ((–) or (▼)) of the main unit or remote controller.
   At this time, the drum motor will not rotate, but the capstan motor will rotate in the direction in which the tape is rewound by the supply reel table.
3) Continue pressing the PAUSE/STILL button for the supply reel table to wind the tape.
   Note 1: To shift in the PLAY, FF/REW directions without loading the cassette tape, refer to Fig. 3-1-2, press the "lever, lid opener vc" ① of the "compl, cassette mecha vc" from the top to release the lock, and make sure the "stand, l vc" ② does not get caught.

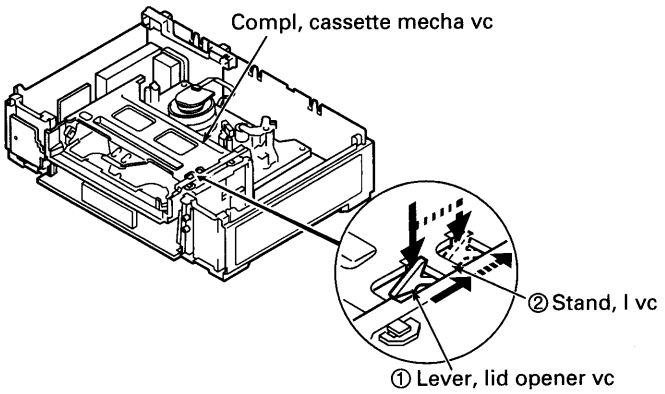


Fig. 3-1-2

3-1-3. EXITING THE SERVICE MODE

1) The service mode can be exited by turning off the power.
2) After exiting the mode, normal operations can be performed.

3-2. DRIVING THE LOADING MOTOR ("ASSY, MOTOR LOADING BB VC") BY SUPPLYING DC VOLTAGE

The loading motor shown in Fig. 3-2-1 ("assy, motor loading bb vc") can be driven by supplying DC6V to DC11V voltage to its terminals.

1) Disconnect the power plug.
2) Refer to 4-1, and remove the mechanism unit.
3) To rotate in the PLAY and FF/REW directions, connect the + pole to terminal A and the – pole to terminal B. To rotate in the EJECT direction, connect the – pole to terminal A and the + pole to terminal B.

   Note 1: To rotate in the PLAY, FF/REW directions, refer to Fig. 3-1-2, press the "lever, lid opener vc" ① of the "compl, cassette mecha vc" from the top to release the lock, and make sure the "stand, l vc" ② does not get caught.

   Note 2: If the loading motor ("assy, motor loading bb vc") stops rotating after shifting to the FF/REW and EJECT modes, stop supplying the DC voltage.

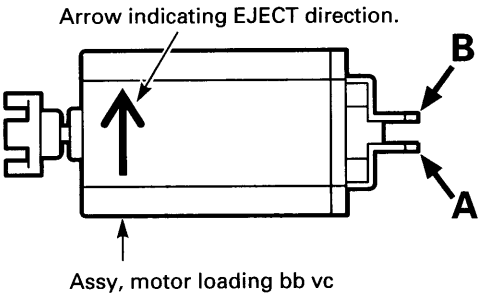


Fig. 3-2-1

3-3. OPERATING THE MECHANISM MANUALLY

1) Refer to 4-1 and remove the mechanism unit.
2) Rotate the loading motor ("assy, motor loading bb vc") at the bottom of the mechanism unit with your finger.
   For the unloading direction (EJECT direction), rotate the loading motor ("assy, motor loading bb vc") in the direction of the arrow marked on the loading motor ("assy, motor loading bb vc") with your finger. For the loading direction (FF/REW direction), rotate in the opposite direction of the arrow. (Refer to Fig. 3-2-1.)

4. DISASSEMBLING THE MAIN PARTS OF THE MECHANISM

PRECAUTIONS

- Disassemble and assemble the mechanism in the EJECT mode.
- Assemble the mechanism in the opposite order of disassembly referring to "Precautions on Assembly".
- When removing the mechanism unit from the main unit, handle it carefully so that the parts do not damage.
  In particular, when the "compl, cassette mecha vc" is removed to turn over the mechanism, handle it carefully as the "lever, ep sw vc" may damage easily.
- As plastic clamps are used for preventing the parts from dislocating, be careful not to apply excessive force and cause damages.

4-1. MECHANISM UNIT (Refer to Fig. 4-1-1 to Fig. 4-1-3.)

1) Refer to the service manual of the model to be repaired and remove the cabinet parts.
2) Disconnect the connector ① of the "assy, head r/p ace vc", flexible cable ② of the "motor stator, cyl dc 2w vc", and flexible cable ③ of the "assy, cylinder lwr".
3) Remove the two screws ④ at the bottom of the chassis.
4) Remove the four screws ⑤ at the top of the chassis. To remove the two screws ⑤ in front, press down the "lever, lid opener vc" ⑥ of the "compl, cassette mecha vc" from the top to release the lock, and move the "tray vc" ⑦. Be careful not to apply excessive force to the "tray vc" ⑦.
5) Lift the mechanism unit ⑧ towards the top and release.

PRECAUTIONS ON ASSEMBLY

1. When attaching the mechanism unit ⑧, check that the mode switches on the mechanism unit and CP-1 board are set to the EJECT mode position. (Refer to Fig. 4-1-2, and Fig. 4-1-3.)
2. Attaching the mechanism unit ⑧ crookedly may cause damage of the "board to board" connector. To avoid this, while holding the mechanism unit ⑧ horizontally, fit the two dowels ⑨ on the chassis to the holes and set in place.
3. Check that the tape sensor is at the designated position.
4. Tighten the four screws ⑤ in the following order;right (rear) → right (front) → left (front) → left (rear).

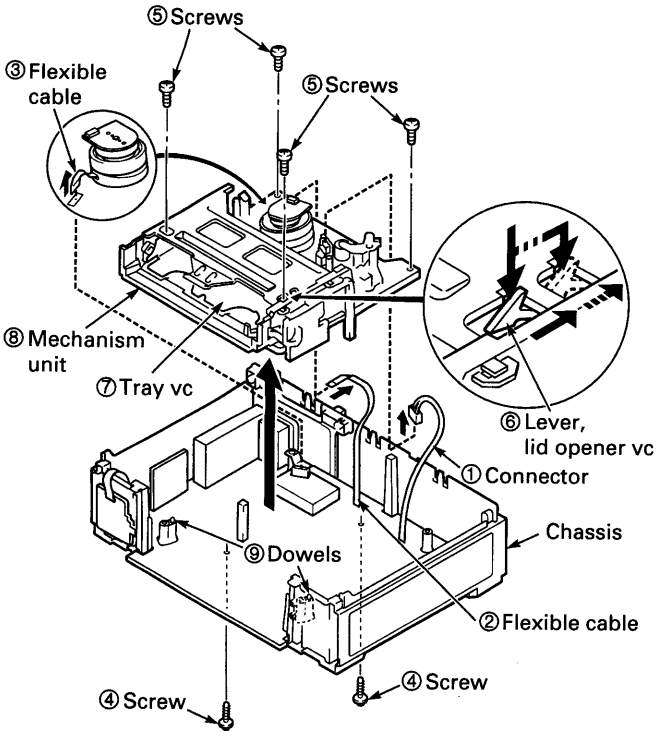


Fig. 4-1-1

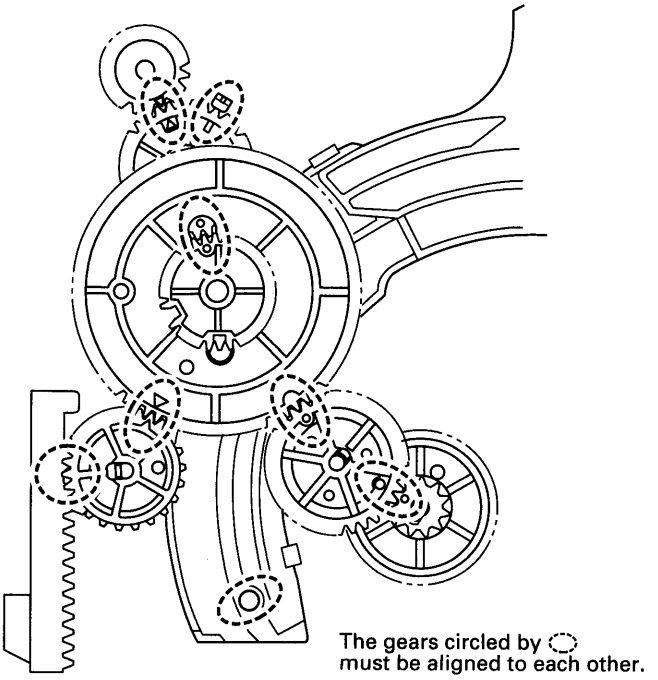


Fig. 4-1-2

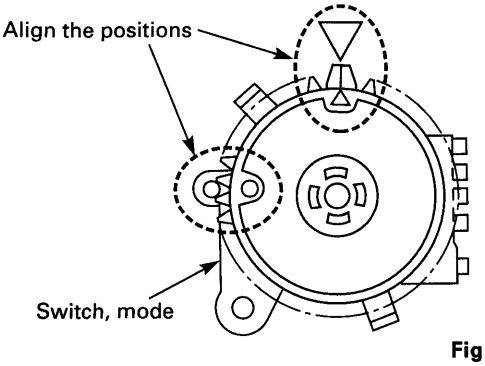


Fig. 4-1-3

4-2. CASSETTE MECHANISM

4-2-1. COMPL CASSETTE MECHA [1] (Refer to Fig. 4-2-1.)

1) Remove the two screws ①.
2) Lift the back of the "compl, cassette mecha vc"② slightly and slide it backwards to remove.

PRECAUTIONS ON ASSEMBLY

1. Fit the two hooks ③ in front to the two holes ④ on the mechanism chassis, adjust the four dowels ⑤ to the four holes ⑥, and attach the "compl, cassette mecha vc" ②.
   At this time, press the "lever, ep sw vc"⑦ to the front. (Refer to Fig. 4-2-1.)
2. Tighten the two screws ① with a torque of 5.9 to 6.0 kg/cm.

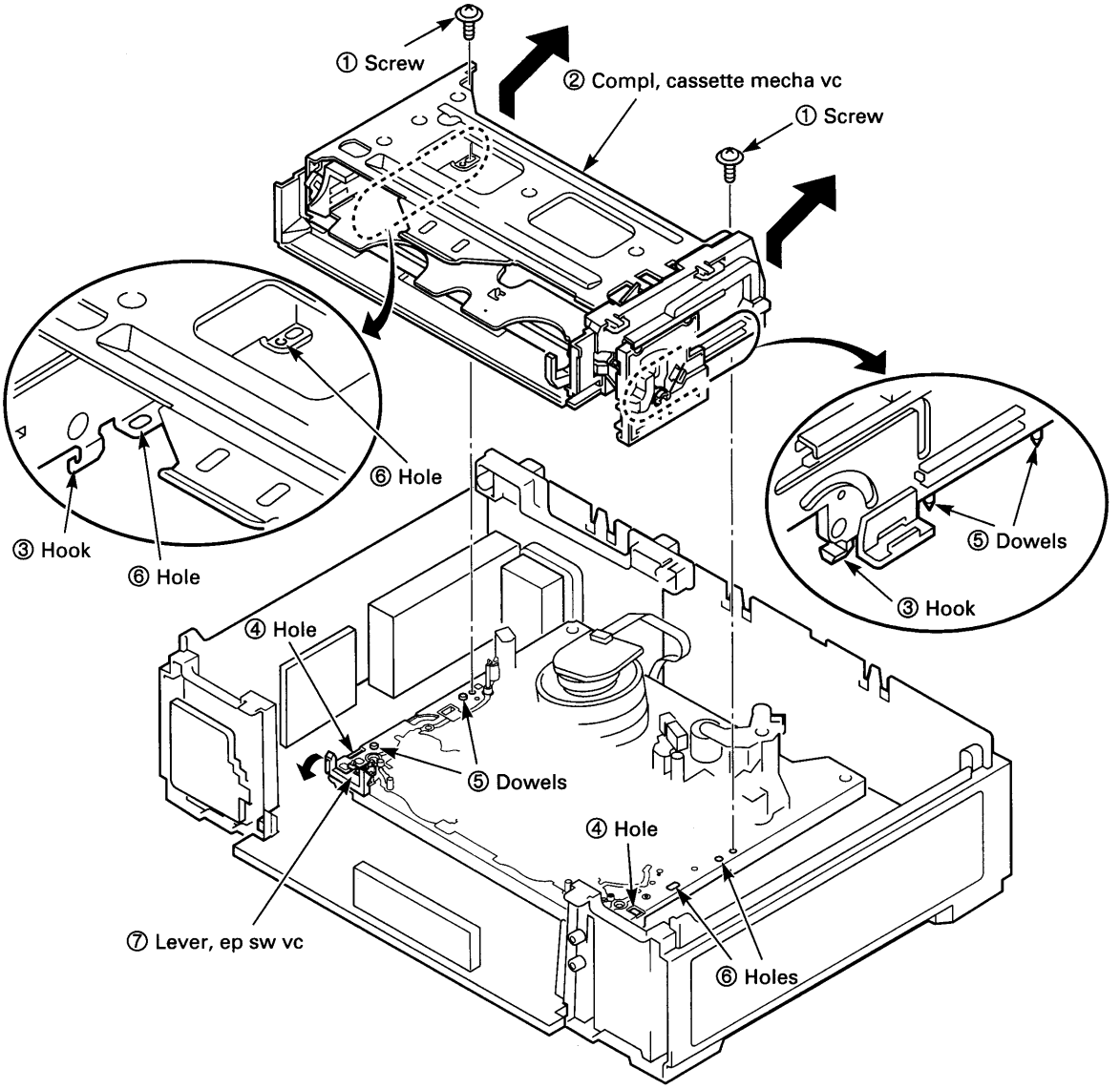


Fig. 4-2-1

4-2-2. COMPL CASSETTE MECHA [2]

(Refer to Fig. 4-2-2 to Fig. 4-2-13.)

1) Remove the two clamps ① and remove the "sensor hood" ②.
2) Remove the two clamps ③ and pull out the "frame under" ④ towards the front.
3) Remove the "spring, start vc" ⑤.
4) Press the "lever, lid opener vc" ⑥ to release the lock, and remove the "slide, drive vc" ⑦.
5) Remove the "lever, door opener vc" ⑧.
6) Remove the two clamps ⑩ of the "stand, r vc" ⑨, pull out the "stand, l vc" ⑪, and then remove the "stand r vc" ⑨.
7) Press the tip of the "lever, drive l vc" ⑫ to remove it from the shaft ⑭ of the "guide, cassette l vc" ⑬, and remove the assembly parts of the "lever, drive l vc" ⑫/"lever, drive r vc" ⑮/"shaft, drive vc"⑯.
   When removing the "lever, drive r vc" ⑮ from the "guide, cassette r vc" ⑰, be careful not to damage the projection of the shaft ⑱.
8) Remove the two "spring, tray vc" ⑲.
9) Remove the "spring, lid opener vc" ⑳.
10) Press the "lever, lid opener vc" ⑥ in the direction of the arrow shown in Fig. 4-2-3, remove the two clamps ㉑ with the notch of the "lever, lid opener vc" ⑥ aligned with the protrusion of the shaft of the "guide, cassette r vc" ⑰, and pull out the "lever, lid opener vc" ⑥.
11) Remove the two clamps ㉒ shown in Fig. 4-2-3, and pull out the "guide, cassette r vc" ⑰.
12) Remove the two clamps ㉓ shown in Fig. 4-2-4, and pull out the "guide, cassette l vc" ⑬.
13) Insert a thin slotted screwdriver into the hole ㉔ on the "guide, cassette r vc" ⑰ shown in Fig. 4-2-3 and remove the clamp ㉕, and pull out the "spring , plate vc" ㉖. In the same way, insert a thin slotted screwdriver in the hole ㉗ of the "guide, cassette l vc" ⑬ shown in Fig. 4-2-4 and remove the clamp ㉘, and pull out the "spring, plate vc" ㉙.
14) Remove the screw ㉚ shown in Fig. 4-2-2, and remove the "spring, tray earth vc" ㉛. In almost all models, the screw ㉚ and "spring, tray earth vc" ㉛ are not used.

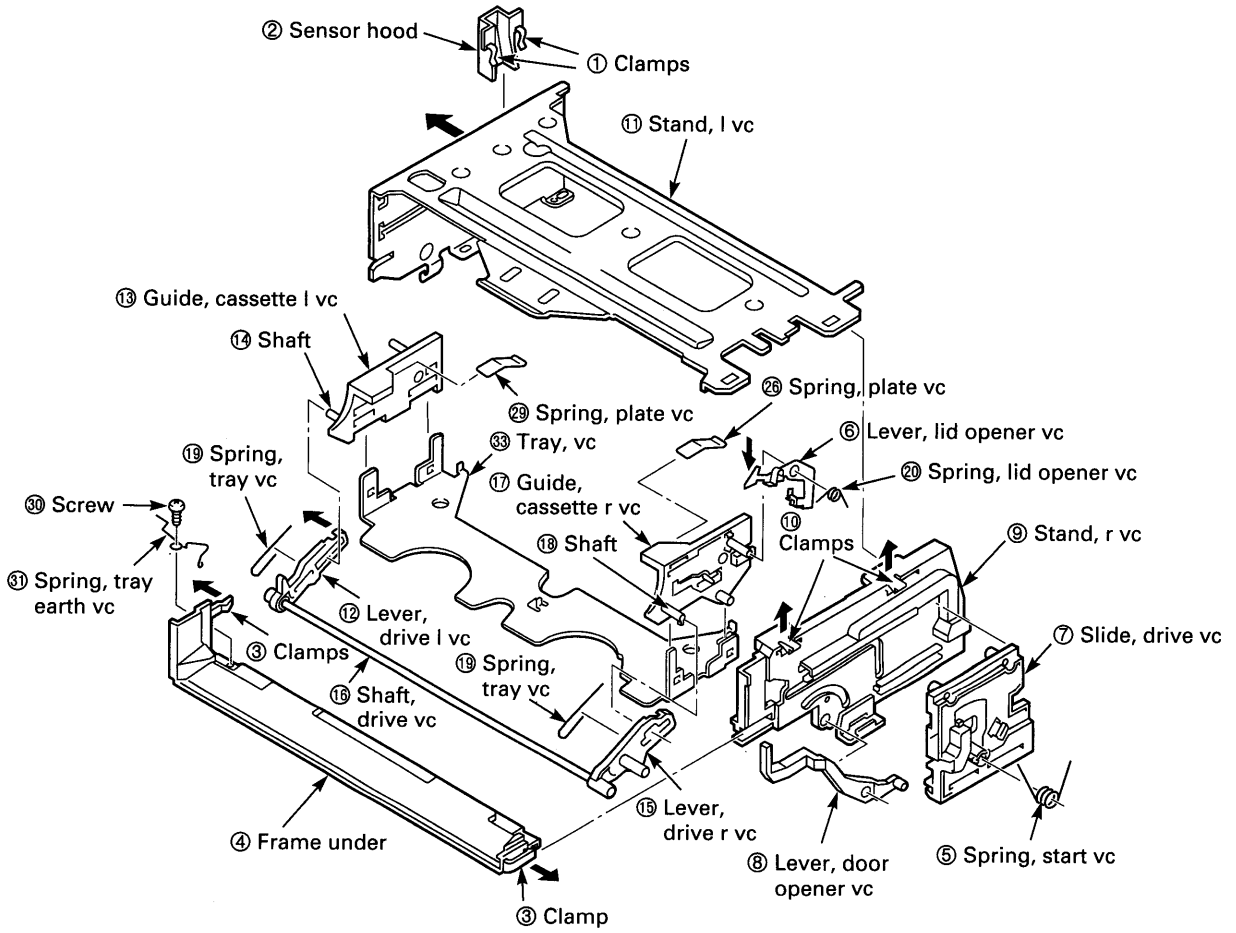


Fig. 4-2-2

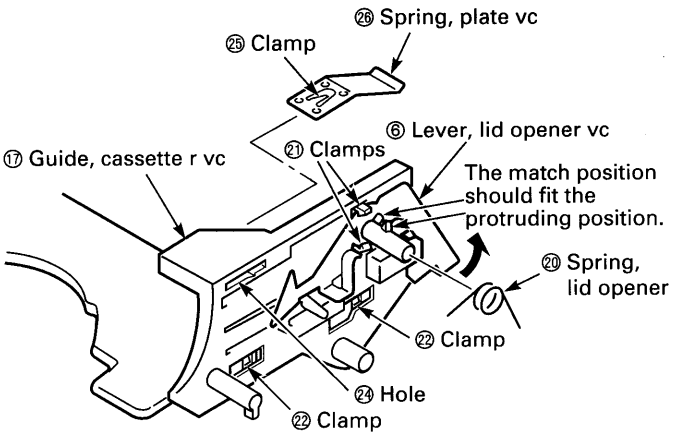


Fig. 4-2-3

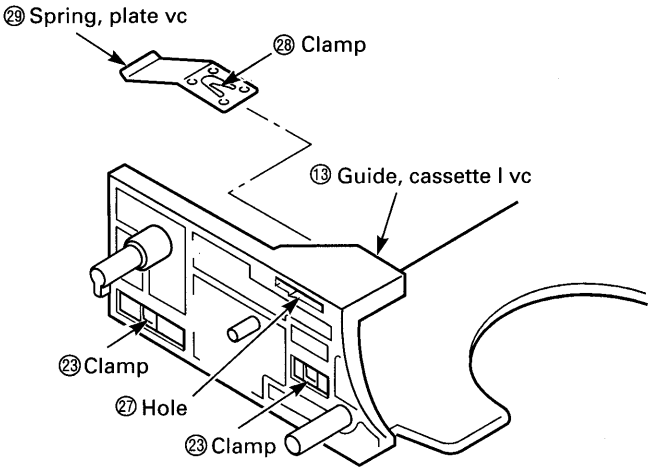


Fig. 4-2-4

PRECAUTIONS ON ASSEMBLY

1. Check that the "spring, plate vc" ㉖ and ㉙ do not come off after attaching to the "guide, cassette l/r vc" ⑬ and ⑰.
2. As shown in Fig. 4-2-5, hook the "spring, lid opener vc" ⑳ to the shaft ㉜ properly.
3. Refer to Fig. 4-2-6 to Fig. 4-2-11, and apply grease (VHJ-0100) to the "stand, r/l vc" ⑨ and ⑪, "slide, drive vc" ⑦, and "lever, door opener vc" ⑧. (Apply grease to the shaded parts.)
4. As shown in Fig. 4-2-12 and Fig. 4-2-13, check that the shafts of the "guide, cassette l/r vc" ⑬ and ⑰ and "lever, drive l/r vc" ⑫ and ⑮ are inserted properly into the "stand, r/l vc" ⑨ and ⑪.
   Fig. 4-2-12 and Fig. 4-12-13 show the positions of the shafts in the EJECT mode.
   Insert the shafts into the "stand, r/l vc" ⑨ and ⑪ with the "tray, vc" ㉝ descended.
5. After assembling, move the "slide, drive vc" ⑦ forward and backward, and check that the "tray, vc" ㉝ rises and descends smoothly and the "lever, door opener vc" ⑧ opens and closes smoothly.

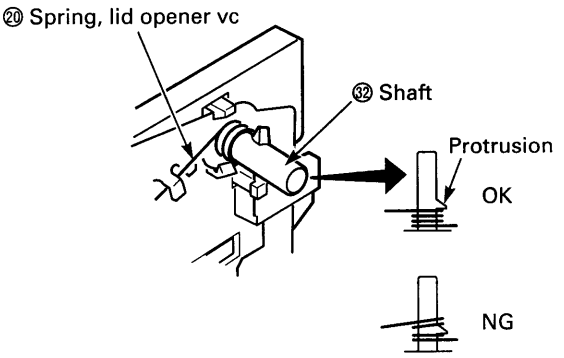


Fig. 4-2-5

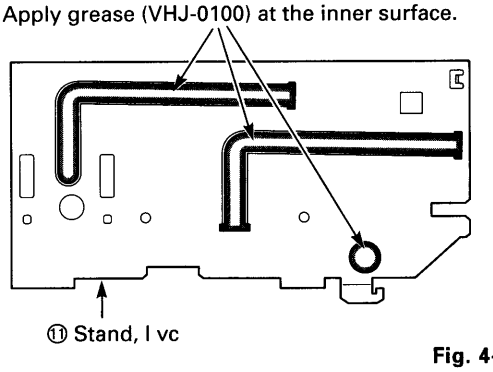


Fig. 4-2-6

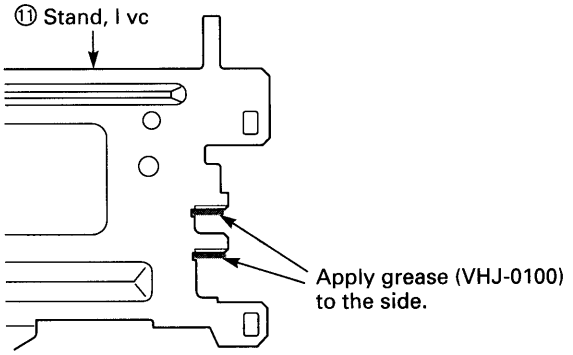


Fig. 4-2-7

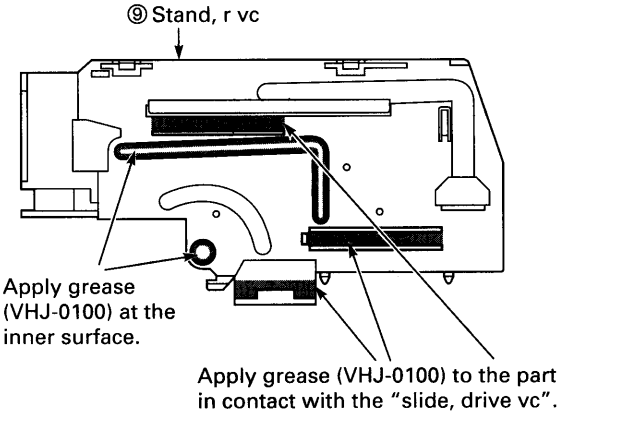


Fig. 4-2-8

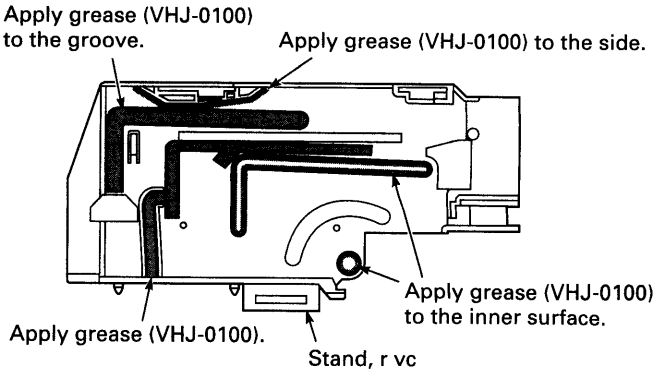


Fig. 4-2-9

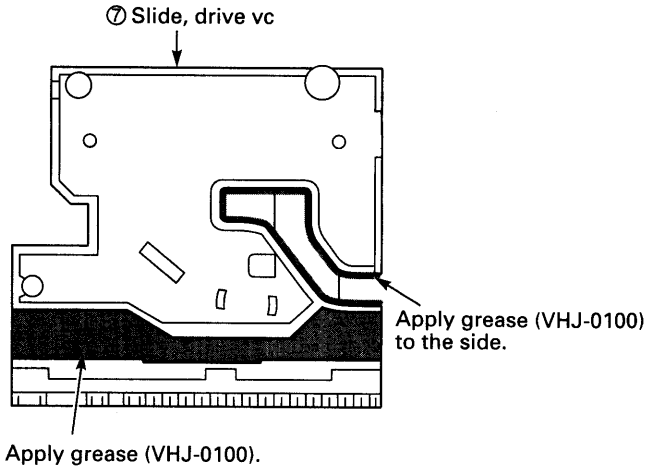


Fig. 4-2-10

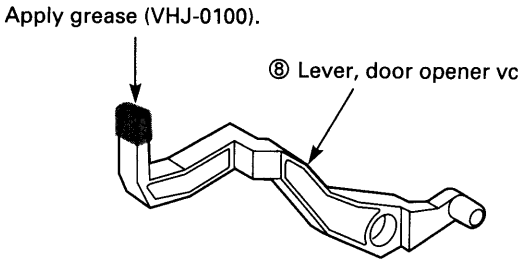


Fig. 4-2-11

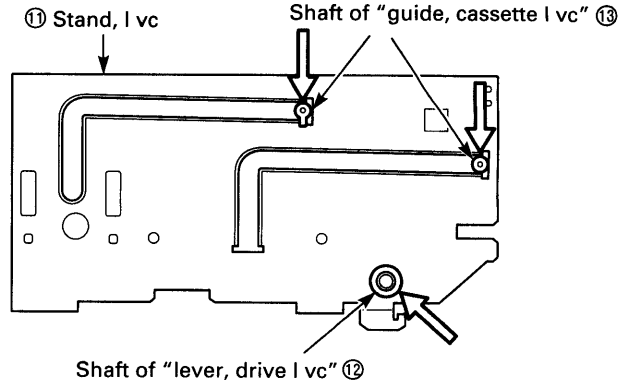


Fig. 4-2-12

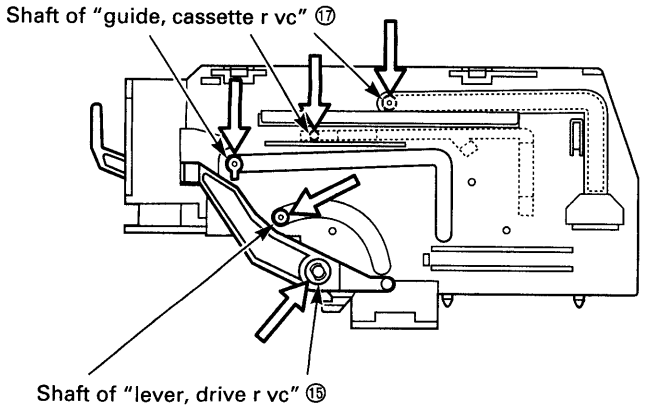


Fig. 4-2-13

4-3. COMPL LEVER CLEANER (Refer to Fig. 4-3-1.)

1) Remove the clamp ①, and remove the "lever, cleaner" ②.
2) Remove the clamp ③, and remove the "assy, mounting cleaner" ④.

PRECAUTIONS ON ASSEMBLY

1. Be careful not to dirty the "assy, mounting cleaner" ④.
2. When attaching the "lever, cleaner" ②, hold the clamp ① with the plastic spring ⑥ pressed against the stopper ⑤ and attach.

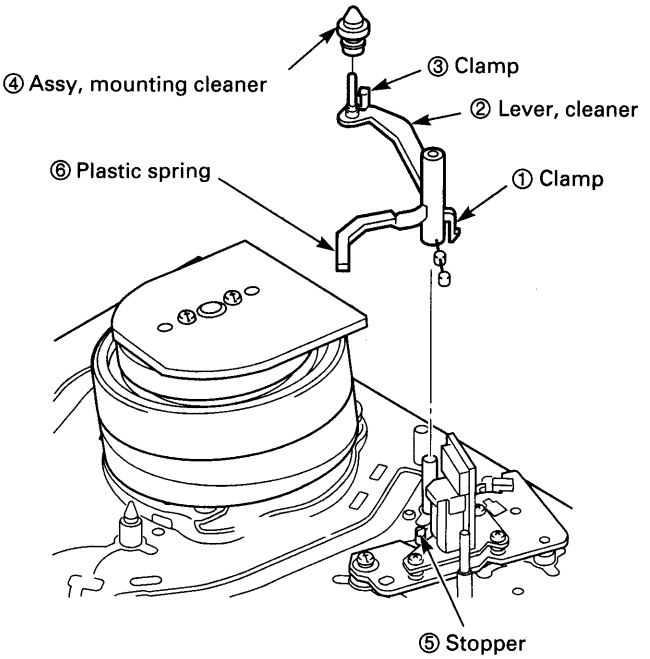


Fig. 4-3-1

4-4. CYLINDER (DRUM) (Refer to Fig. 4-4-1 to Fig. 4-4-3.)

4-4-1. CYLINDER (DRUM) MOTOR, ASSY CYLINDER UPR XXXX

1) Disconnect the flexible cable ② connected to the "motor, stator, cyl dc 2w vc" ①.
2) Remove the two screws ③, and remove the "motor, stator, cyl dc 2w vc" ①, and "spring, earth cylinder" ④.
   In this state, the "earth chip cylinder" ⑤ will fall off if the top and bottom of the mechanism unit are reversed.
   Note: "earth chip cylinder" ⑤ can be removed by removing the "mounting motor, cylinder" ⑨ in step 4).
3) Remove the two screws ⑥ and remove the "motor, rotor, cyl dc 2w vc" ⑦.
4) Loosen the screw ⑧ with the hexagonal wrench, and remove the "mounting, motor, cylinder" ⑨.
   Note: The hexagonal wrench (VHJ-0113) is 2mm diagonally. It is provided with the servicing tool upper drum fitting tool kit (VHJ-0112) .
5) Remove the "assy, cylinder, upr XXXX" ⑩ and the "spacer, cylinder" ⑪.
   The "spacer, cylinder" ⑪ may come off attached to the "assy, cylinder, upr XXXX" ⑩.
   Note: The XXXX of the "assy, cylinder, upr XXXX" display differs according to the model.

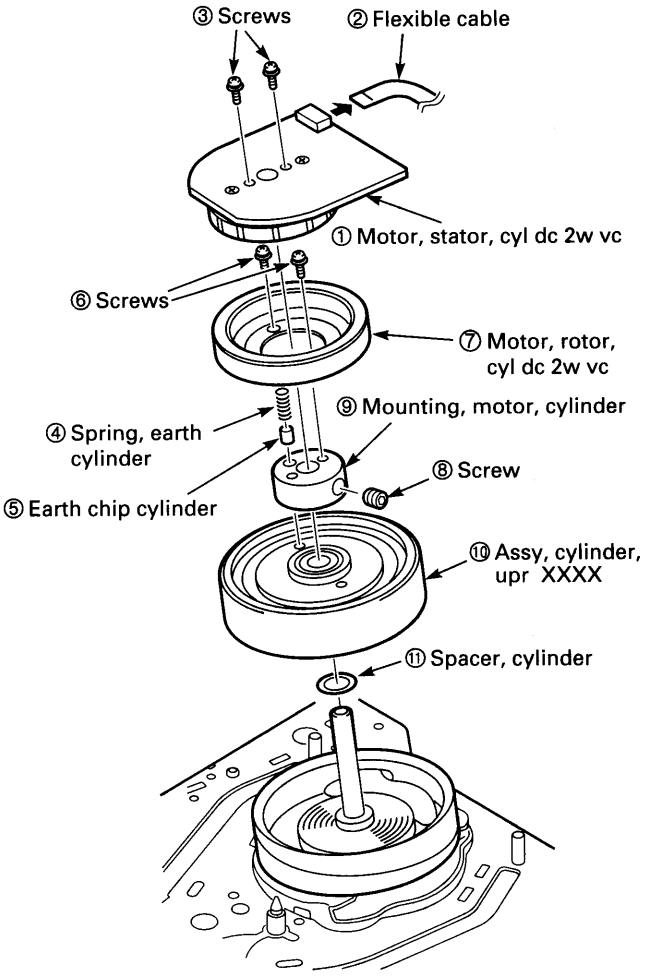


Fig. 4-4-1

PRECAUTIONS ON ASSEMBLY

1. Adjustments are required when attaching the "mounting, motor, cylinder" ⑨. As shown in Fig. 4-4-2, face the protruded side of the "mounting motor, cylinder" ⑨ downwards, and with the hexagonal wrench pressed to screw ⑧, adjust the position of the "mounting motor, cylinder" in the direction of the screw ⑪. In this state, hold the "mounting, motor, cylinder" ⑨ with the upper drum fitting tool (VHJ-0112) and tighten the screw ⑧ with the hexagonal wrench.
2. When attaching the "motor, rotor, cyl dc 2w vc" ⑦, the phase must be adjusted to that of the "assy, cylinder, upr XXXX" ⑩. As shown in Fig. 4-4-3, attach so that the hole ⓐ of the "assy, cylinder, upr XXXX" ⑩ and hole ⓑ of the "motor, rotor, cyl dc 2w vc" ⑦ are on the same side.
3. Tighten the two screws ⑥ for attaching the "motor, rotor, cyl dc 2w vc" ⑦ and the two screws ③ for attaching the "motor, stator, cyl dc 2w vc" ① using a torque of 2.5 to 3.5 kg/cm.
4. Be careful that the tape path surface of the cylinder (drum) does not scratch or become dirty.
   If it becomes dirt, clean.
5. After attaching, refer to "5-3. Adjusting Tape Path" and the section on electrical adjustments in the service manuals for the respective models, and adjust the switching position of the servo circuit.

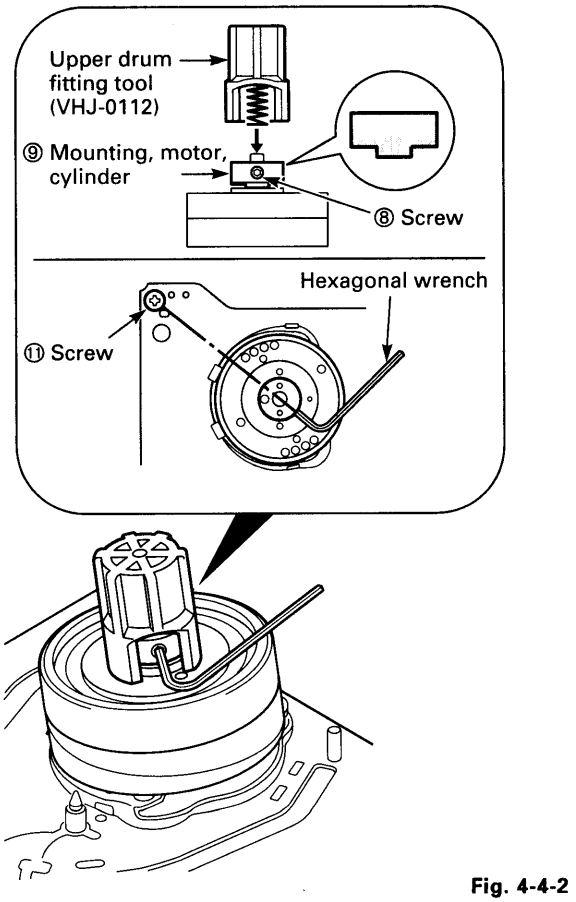


Fig. 4-4-2

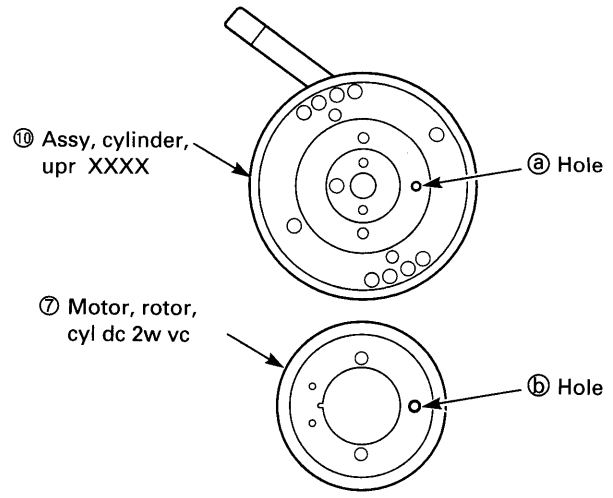


Fig. 4-4-3

4-4-2. COMPL CYLINDER XXXX (REFER TO FIG. 4-4-4.)

1) Refer to 4-1 and remove the mechanism unit.
2) Refer to 4-4-1 and remove the "motor, stator, cyl dc 2w vc", "motor, rotor, cyl dc 2w vc", "spring, earth cylinder", and "earth chip cylinder".
3) Remove the three screws ① at the bottom of the mechanism and remove the "compl, cylinder XXXX" ②.

Note: The XXXX of the "compl, cylinder, XXXX" display differs according to the model.

PRECAUTIONS ON ASSEMBLY

1. Be careful that the tape path surface of the cylinder (drum) does not scratch or become dirty. If it becomes dirt, clean.
2. Adjust the "compl, cylinder XXXX" ② to the two dowels ③ of the mounting part of the mechanism chassis.
3. Tighten the three screws ① with a 3.9 to 4.2 kg/cm torque.
4. There is a need to adjust the phase to the "assy, cylinder, upr XXXX" when attaching the "motor, rotor, cyl dc 2w vc".

   As shown in Fig. 4-4-3, attach so that the hole ⓐ of the "assy, cylinder upr XXXX" ⑩ and hole ⓑ of the "motor, rotor, cyl dc 2w vc" ⑦ are on the same side.
5. After attaching, refer to "5-3. Adjusting Tape Path" and the section on electrical adjustments in the service manuals for the respective models, and adjust the switching position of the servo circuit.

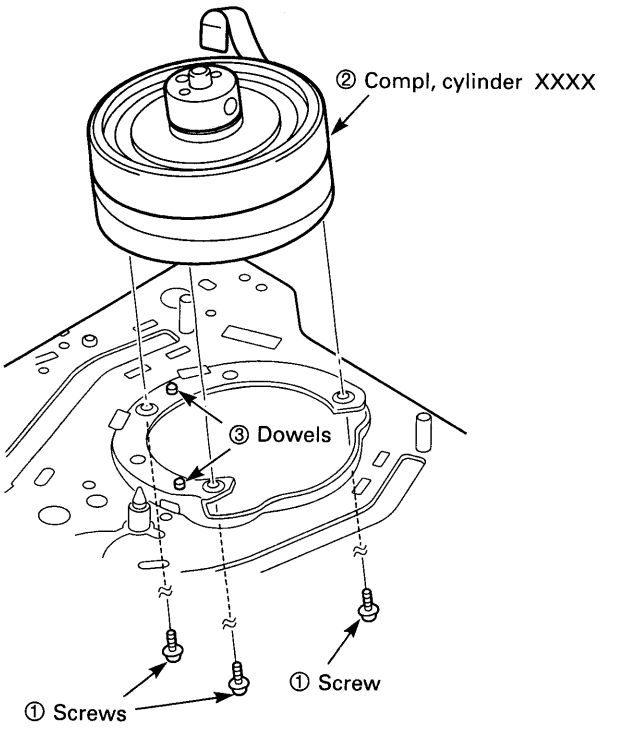


Fig. 4-4-4

4-5. LEVER EP SW VC (Fig. 4-5-1.)

1) Refer to 4-2-1, and remove the "compl, cassette mecha vc".
2) Remove the "spring, ep sw vc" ①.
3) Press the two clamps ② and remove the "lever, ep sw vc" ③.

PRECAUTIONS ON ASSEMBLY

1. Make sure that the clamps ② are hooked properly to the "lever, ep sw vc" ③.

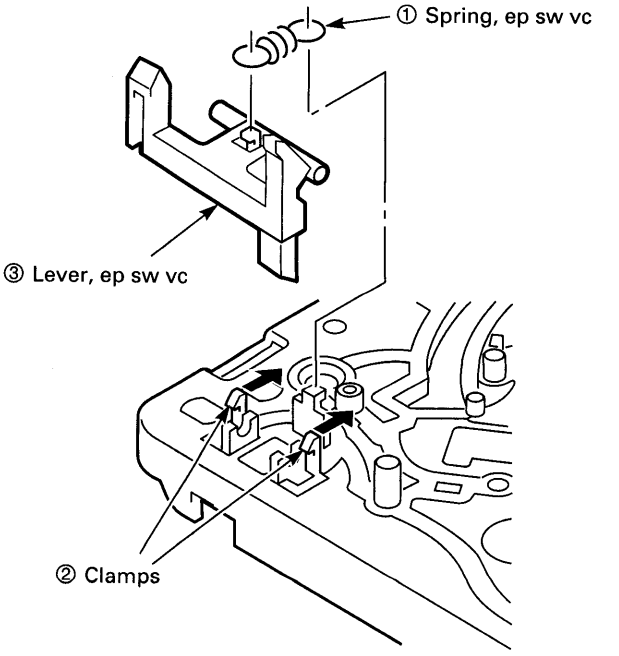


Fig. 4-5-1

4-6. HEAD ERASE FULL VC (Refer to Fig. 4-6-1.)

1) Remove screw ①.
2) Remove the "head, erase full vc" ②.

PRECAUTIONS ON ASSEMBLY

1. Tighten the three screws ① with a 6.0 to 7.0 kg/cm torque.
2. Be careful that the tape path surface does not scratch or become dirty. If it becomes dirt, clean.

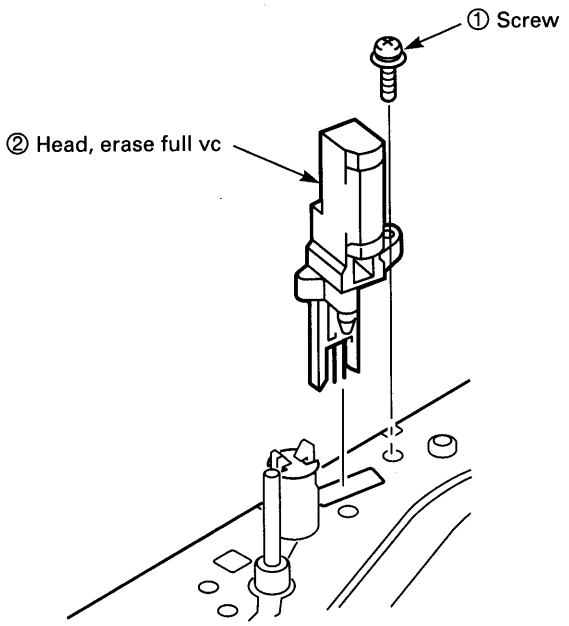


Fig. 4-6-1

4-7. ASSY HEAD R/P ACE VC (Refer to Fig. 4-7-1.)

1) Remove screw ①.
2) As shown in Fig. 4-7-1, press the "assy, head r/p ace vc" ② in the arrow direction and then remove upwards.

PRECAUTIONS ON ASSEMBLY

1. Adjust the hole ③ of the "assy, head r/p ace vc" ② to the position of the pin ④ of the mechanism chassis,
2. Tighten the screw ① with a 4.0 to 5.0 kg/cm torque.
3. After attaching, check that clamp ⑤ of the "lever, cleaner" is hooked to the mounting part of the "assy, head r/p ace vc" ②.
4. Be careful that the tape path surface does not scratch or become dirty. If it becomes dirt, clean.
5. After attaching, refer to "5-3. Adjusting Tape Path" and adjust the tracking (X value).

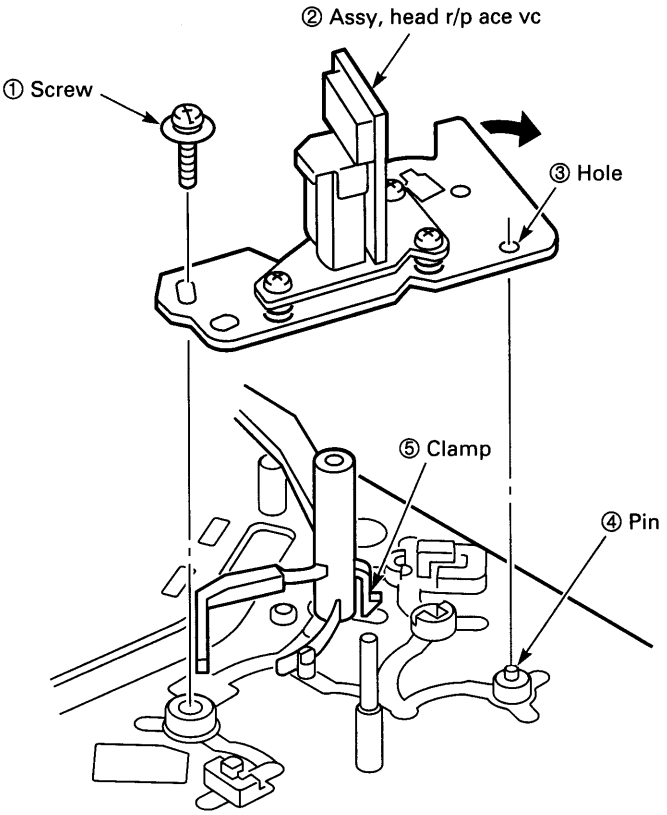


Fig. 4-7-1

4-8. PINCH ROLLER DRIVING SECTION AND ASSY LEVER LOAD VC (Refer to Fig. 4-8-1 to 4-8-7.)

1) Remove the "spring, pinch roller vc" ①.
2) Remove the "assy, lever, pinch vc" ②.
3) Press the clamp ④ of the "mounting, opener vc" ③, and remove the "mounting, lift pinch vc" ⑤.
4) Remove the screw ⑥.
5) Remove the clamps ⑦ and ⑧, and remove the "mounting, opener vc" ③.
6) Remove the "gear, cam pinch vc" ⑨.
7) Remove the washer ⑩, and remove the "assy, lever load vc" ⑪ and "spring, lever load vc" ⑫.
8) Slide the "gear, rack pinch vc" ⑬ in the rear direction fully and then remove it.

PRECAUTIONS ON ASSEMBLY

1. Refer to Fig. 4-8-2 to Fig. 4-8-5, and apply grease (VHJ-0100) to the "gear, rack pinch vc" ⑬, "gear, cam pinch vc" ⑨, "mounting, opener vc" ③, and sliding parts of the mechanism chassis. (Apply grease to the shaded parts.)
2. After attaching the "gear, rack pinch vc" ⑬, slide it until it touches the front.
3. Refer to Fig. 4-8-6, and insert one end of the "spring, lever load vc" ⑫ into the hole ⑭ of the outserter and hook the other end to the "assy, lever load vc" ⑪.
4. Refer to Fig. 4-8-7, and align the △ mark to the "gear, cam pinch vc" ⑨ and "gear, relay pinch vc" ⑮.
5. Tighten the screw ⑥ with a 5.0 to 6.0 kg/cm torque.
6. Check that the clamps ⑦ and ⑧ of the "mounting, opener vc" ③ are hooked properly to the mechanism chassis. Check that the clamp ④ is hooked properly to the "mounting, lift pinch vc" ⑤.

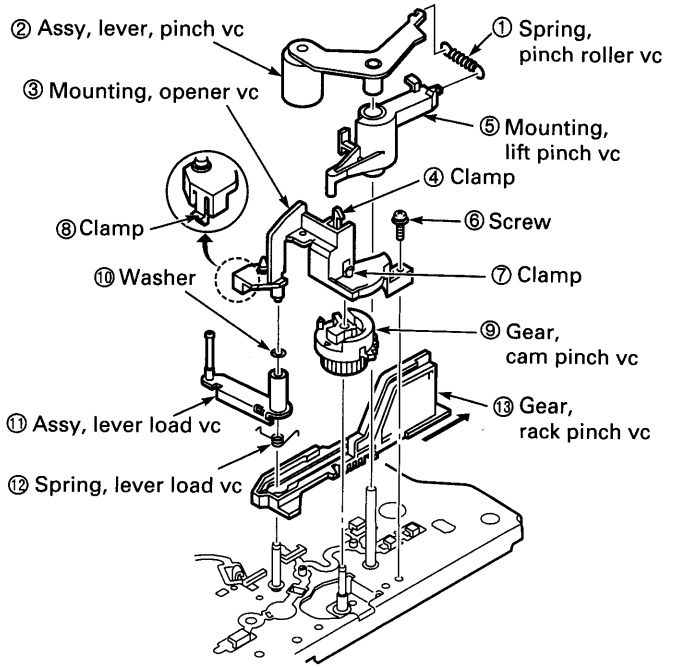


Fig. 4-8-1

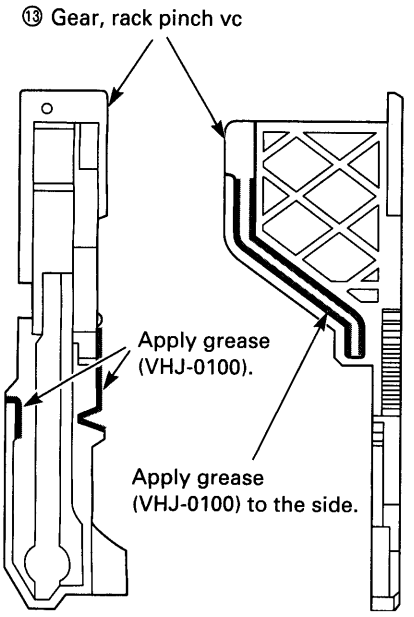


Fig. 4-8-2

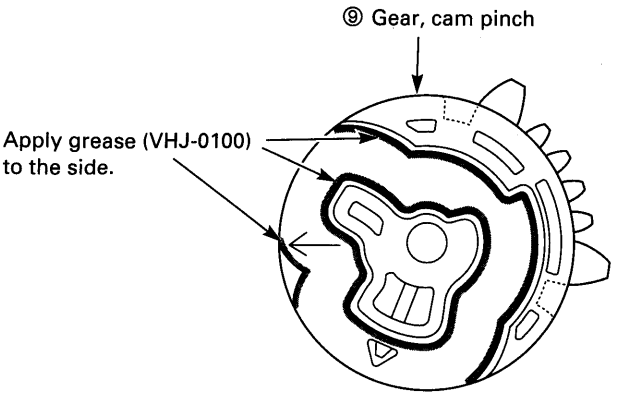


Fig. 4-8-3

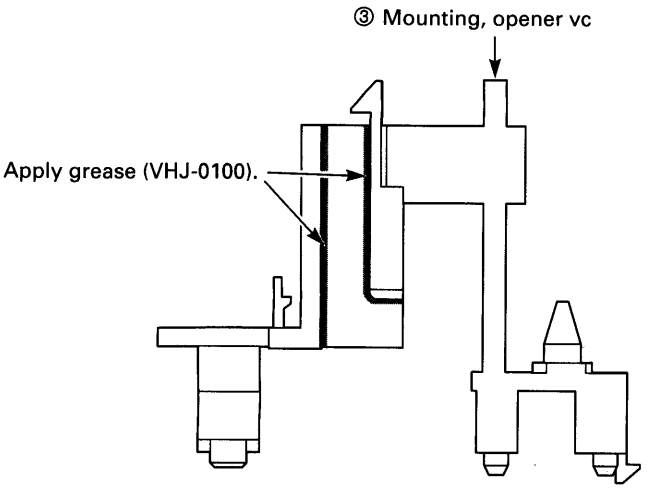


Fig. 4-8-4

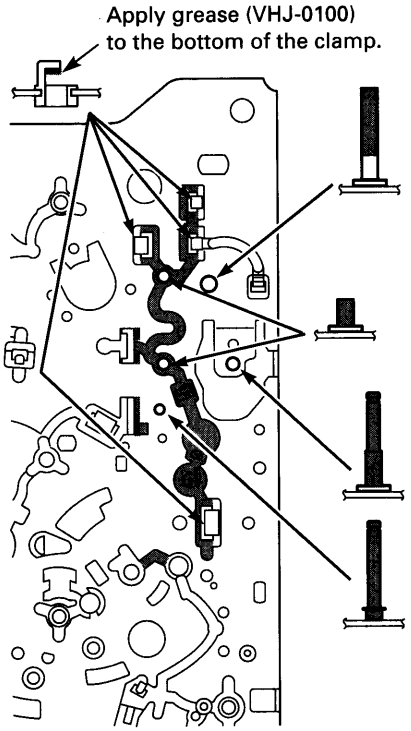


Fig. 4-8-5

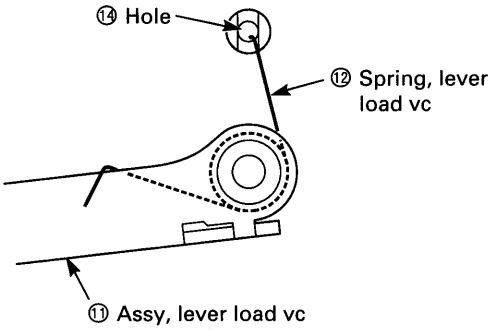


Fig. 4-8-6

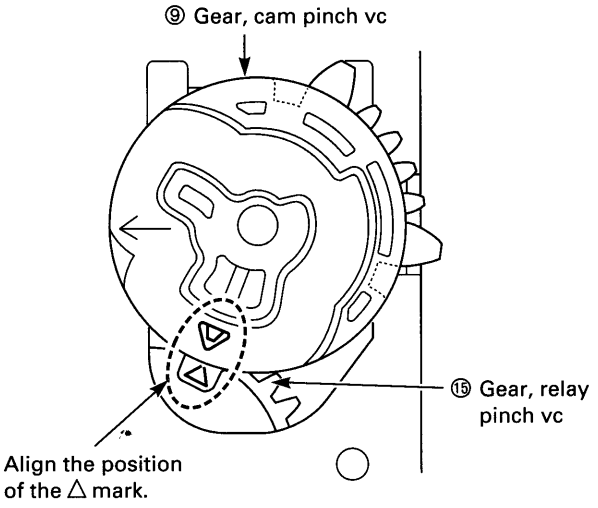


Fig. 4-8-7

4-9. CAPSTAN MOTOR

4-9-1. ASSY BRAKE CAPSTAN (REFER TO FIG. 4-9-1.)

1) Remove the "spring, brake capstan" ①.
2) Remove the clamp ②, and remove the "assy, brake capstan" ③.

PRECAUTIONS ON ASSEMBLY

1. Check that the clamp ② is hooked properly to the mechanism chassis .

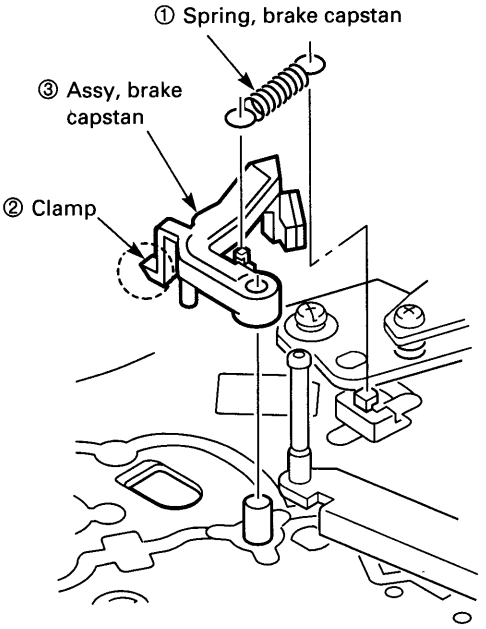


Fig. 4-9-1

4-9-2. MOTOR CAPSTAN DC 3W VC (REFER TO FIG. 4-9-2.)

1) Refer to 4-1 and remove the mechanism unit.
2) Remove the "belt, reel vc" ① at the bottom of the mechanism unit.
3) Remove the screw ②, and remove the "mounting capstan" ③.
4) Remove the three screws ④, and remove the "motor, capstan dc 3w vc" ⑤.

PRECAUTIONS ON ASSEMBLY

1. Tighten the three screws ④ in the order of a, b, then c with a torque of 3.25 to 3.75 kg/cm.
2. Insert the protruded part ⑥ of the "mounting capstan" ③ into the hole ⑦ of the mechanism chassis.
3. Be careful that the capstan shaft does not scratch or become dirty. If it becomes dirt, clean.

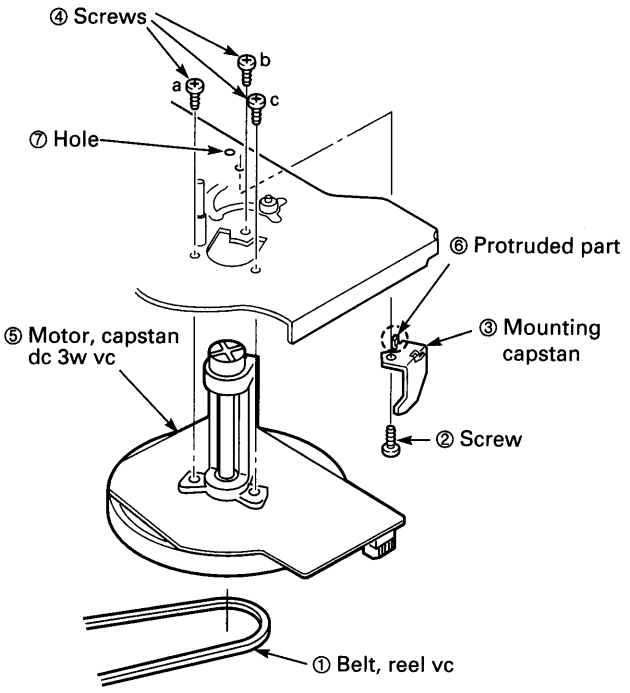


Fig. 4-9-2

4-10. GEAR LOCK VC, GEAR WHEEL 1/2, CAM MAIN, GEAR RELAY PINCH VC (Refer to Fig. 4-10-1 to Fig. 4-10-3.)

1) Refer to 4-1 and remove the mechanism unit.
2) Remove the clamp ① at the bottom of the mechanism unit, and remove the "gear, lock vc" ②.
3) Remove the clamp ③, and remove the "gear, wheel 2" ④.
4) Remove the "special washer" ⑤, and remove the "cam main" ⑥.
5) Remove the clamp ⑦, and remove the "gear, wheel 1" ⑧.
6) Remove the clamps ⑨ and ⑩, and remove the "gear, relay pinch vc" ⑪.

PRECAUTIONS ON ASSEMBLY

1. Apply grease (VHJ-0100) to the shaded part ⓐ in Fig. 4-10-2, and grease (VHJ-0114) to the shaded part ⓑ.
2. Apply grease (VHJ-0100) to the teeth of the "gear, wheel 2" ④, "gear, wheel 1" ⑧, "cam main" ⑥, and "gear, lock vc" ②. Also apply grease to the groove of the "cam main" ⑥.
3. As shown in Fig. 4-10-3, align the gear phase of the "gear, relay pinch vc" ⑪, "gear, wheel 2" ④, "gear, wheel 1" ⑧, "cam main" ⑥, and "gear, lock vc" ②.

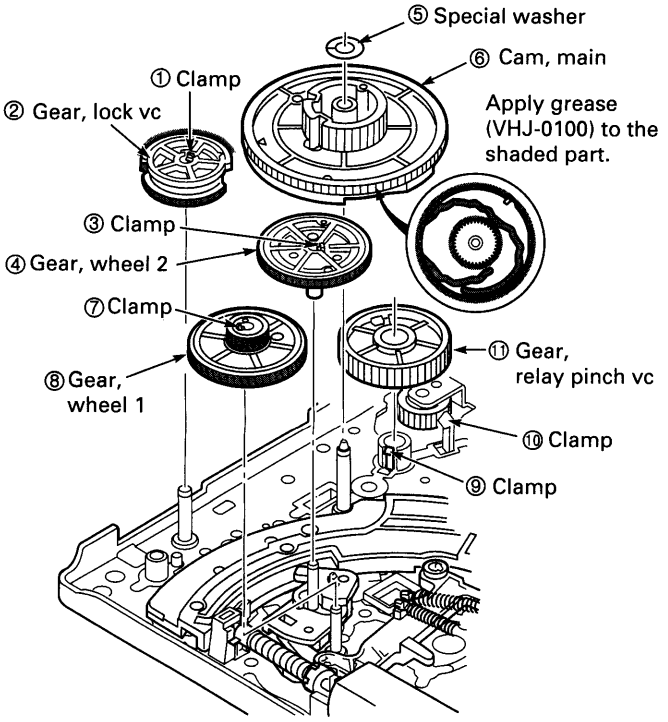


Fig. 4-10-1

ⓐ Apply grease (VHJ-0100).
ⓑ Apply grease (VHJ-0114).

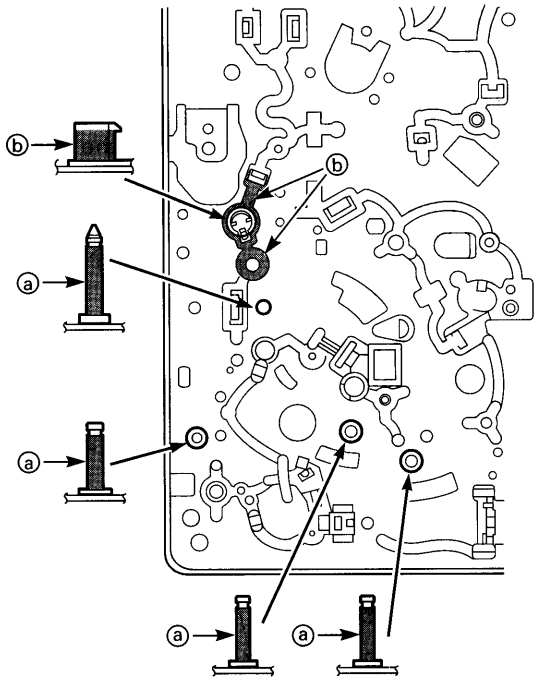


Fig. 4-10-2

Check that the position of the ◌ part is correct.

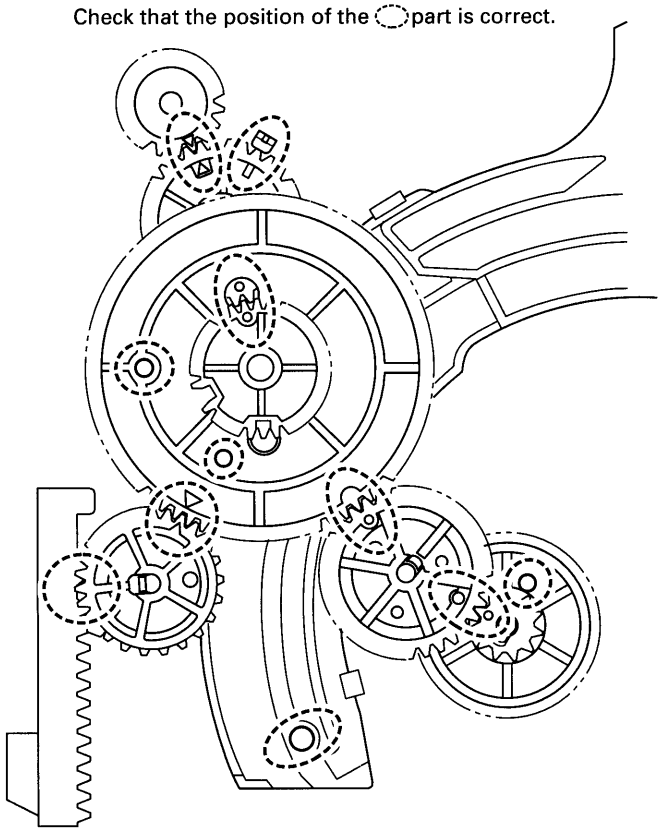


Fig. 4-10-3

4-11. LOADING MOTOR (Refer to Fig. 4-11-1 and Fig. 4-11-2.)

1) Refer to 4-1 and remove the mechanism unit.
2) Refer to 4-10 and remove the "gear, wheel 2" and "gear, wheel 1" at the bottom of the mechanism chassis.
3) As shown in Fig. 4-11-2. Insert a slotted screwdriver into the space between the mechanism chassis and "assy, motor loading bb vc" ①, and press in the arrow direction to remove the "assy, motor loading bb vc" ①, "compl, gear, worm" ②, and damper ③. (refer to fig. 4-11-1)

PRECAUTIONS ON ASSEMBLY

1. Apply grease (VHJ-0114) to the shaft hole of the "compl, gear, worm" ②.
2. Apply grease (VHJ-0100) to the bearing of the outserter of the mechanism chassis.
3. After attaching, check that the "assy, motor loading bb vc" ① is supported properly by the clamps.

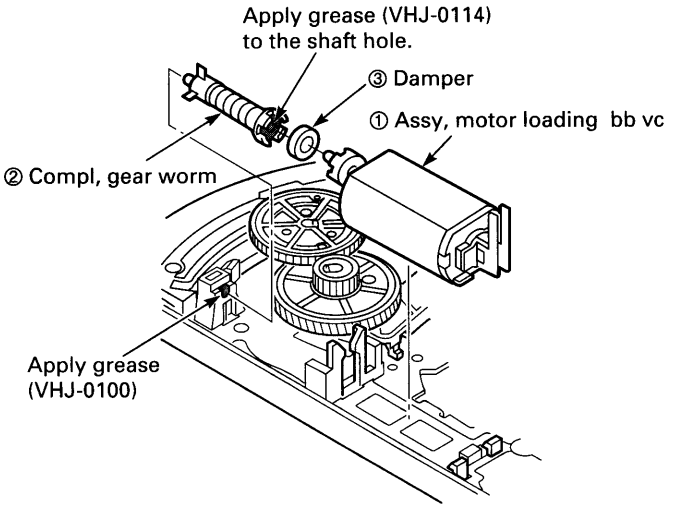


Fig. 4-11-1

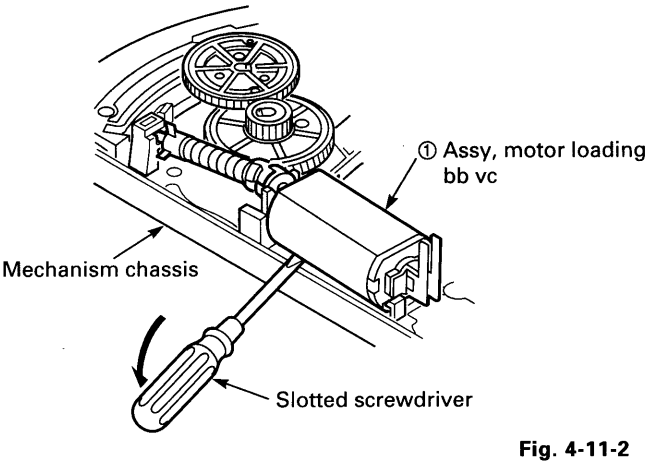


Fig. 4-11-2

4-12. ASSY LEVER BT, ASSY BRAKE BAND (Refer to Fig. 4-12-1.)

1) Refer to 4-1 and remove the mechanism unit.
2) Refer to 4-2, and remove the "compl, cassette mecha vc".
3) Remove the screw ① and remove the "mounting, bt band vc" ②.
4) Remove the "spring, bt" ③.
5) Remove the clamps ④ at the bottom of the mechanism chassis, and remove the "assy, lever, bt" ⑤.
6) Remove the clamp ⑦ of the "assy, brake, band" ⑥. Then adjust the other end of the "assy, brake, band" ⑥ shown in Fig. A to the protrusion of the "assy, lever, bt" ⑤, then remove.

PRECAUTIONS ON ASSEMBLY

1. Apply grease (VHJ-0100) to the hole ⑧.
2. Make sure that the "assy, lever, bt" ⑤ does not ride on to the "assy, mounting, incl s vc" ⑨ and stopper ⑩ and deform.
3. As shown in Fig. B, face the longer hook of the "spring, bt" ③ upwards and hook to the "assy, lever, bt" ⑤.
4. After attaching, check that the positions where the two ends of the "assy, brake, band" ⑥ are attached are as shown in Fig. C.
5. Check that the "assy, brake, band" ⑥ is applying a brake to the "reel, spindle vc" ⑫ of the supply side at the "slide, soft s vc" ⑪.

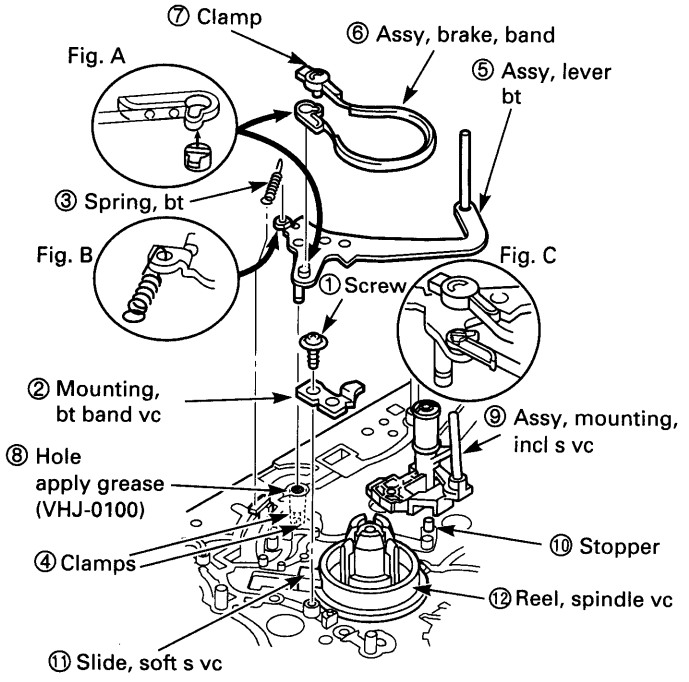


Fig. 4-12-1

4-13. ASSY BRAKE S/T VC, COMPL MOUNTING IDLER VC (Refer to Fig. 4-13-1.)

1) Refer to 4-2, and remove the "compl, cassette mecha vc".
2) Remove the "spring, brake main vc" ①.
3) Remove the clamp ②, and remove the "assy, brake s vc" ③.
4) Remove the clamps ④ and ⑤, and remove the "assy, brake t vc" ⑥.
5) Remove the clamps ⑦ and ⑧ and ⑨, and remove the "compl, mounting, idler vc" ⑩.

PRECAUTIONS ON ASSEMBLY

1. Clean the shaft ⑪ and the apply a drop of oil (VHJ-0099).
2. Apply grease (VHJ-0100) to shafts ⑫ and ⑬.

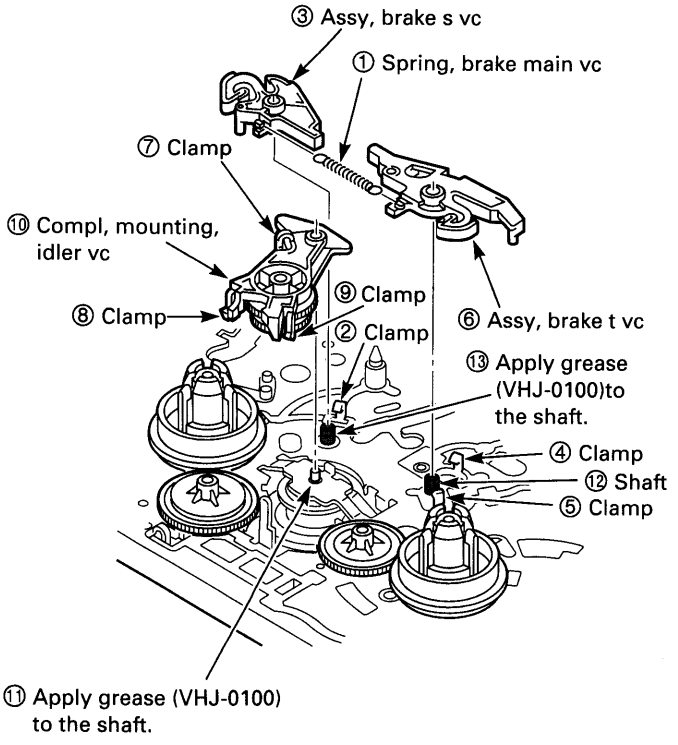


Fig. 4-13-1

4-14. ASSY BRAKE SOFT T VC, TAKE-UP SIDE REEL SPINDLE VC, GEAR REEL T VC (Refer to Fig. 4-14-1.)

1) Refer to 4-2, and remove the "compl, cassette mecha vc".
2) Remove the "spring, brake soft t vc" ①.
3) As shown in Fig. 4-14-1, press the part indicated by an arrow on the "assy, brake, t vc" to release the brake, and then remove the clamps ② and ③, and remove the "assy, brake, soft t vc" ④.
4) With the brake of the "assy, brake t vc" released, remove the "reel, spindle vc" ⑤ and "special washer" ⑥ of the take-up side.
   Make sure no oil nor grease adheres to the side of the "reel, spindle vc".
5) Remove the "gear, reel t vc" ⑦.

PRECAUTIONS ON ASSEMBLY

1. Apply grease (VHJ-0100) to the tip of the "assy, brake, soft t vc" ④ (side contacting the "assy, brake t vc"), and shafts ⑧, ⑨ and ⑩.
2. Insert the pin ⑪ of the "assy, brake, soft t vc" ④ into the groove ⑫ of the "slide, crescent vc".
3. Be careful not to apply grease to the side and bottom fins of the "reel, spindle vc" ⑤ of the take-up side.

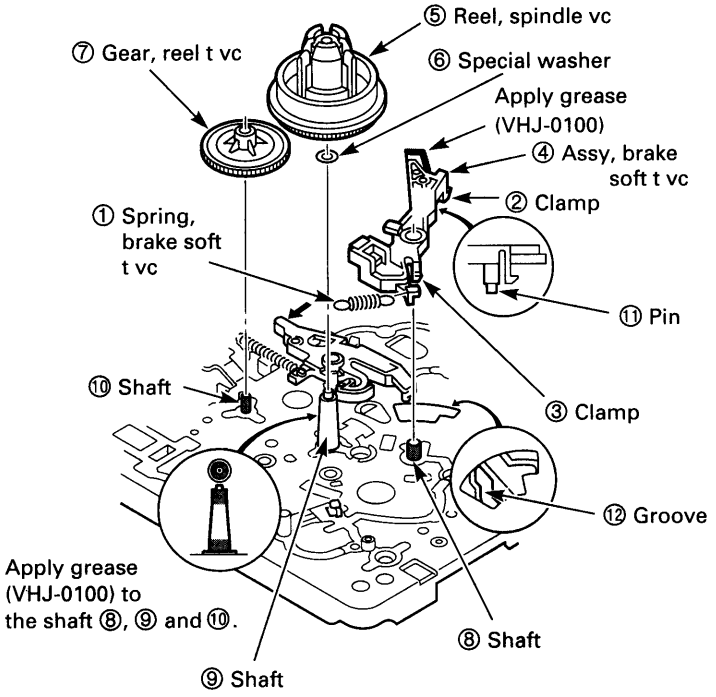


Fig. 4-14-1

4-15. SLIDE SOFT S VC, SUPPLY SIDE REEL SPINDLE VC, GEAR REEL S VC (Refer to Fig. 4-15-1 to 4-15-3.)

1) Refer to 4-1, and remove the mechanism unit.
2) Refer to 4-2, and remove the "compl, cassette mecha vc".
3) Refer to Fig. 4-15-1, and remove the "spring, brake soft s vc" ① at the bottom of the mechanism.
4) Press the "slide, soft s vc" ② in the arrow direction and then remove. At this time, make sure no grease adheres to the "assy, pulley friction vc" and "belt, reel vc".
5) Remove the screw ③ shown in Fig. 4-15-2, and remove the "mounting, bt band vc" ④.
6) Remove the "assy, brake band" ⑤ from the "reel, spindle vc" ⑥. Make sure no oil nor grease adheres to the brake shoe.
7) Remove the "reel, spindle vc" ⑥ and "special washer" ⑦ of the supply side.
   Make sure no oil nor grease adheres to the side of the "reel, spindle vc".
8) Remove the "gear, reel s vc" ⑧.

PRECAUTIONS ON ASSEMBLY

1) Apply grease (VHJ-0100) to the markings on the shafts ⑨ ⑩ shown in Fig. 4-15-2 and "slide, soft s vc" ② shown in Fig. 4-15-3.
2) Check that the plastic part of the "assy, brake band" ⑤ is not riding onto the outserter pin, "assy, lever, bt", and "assy, mounting, incl s vc".

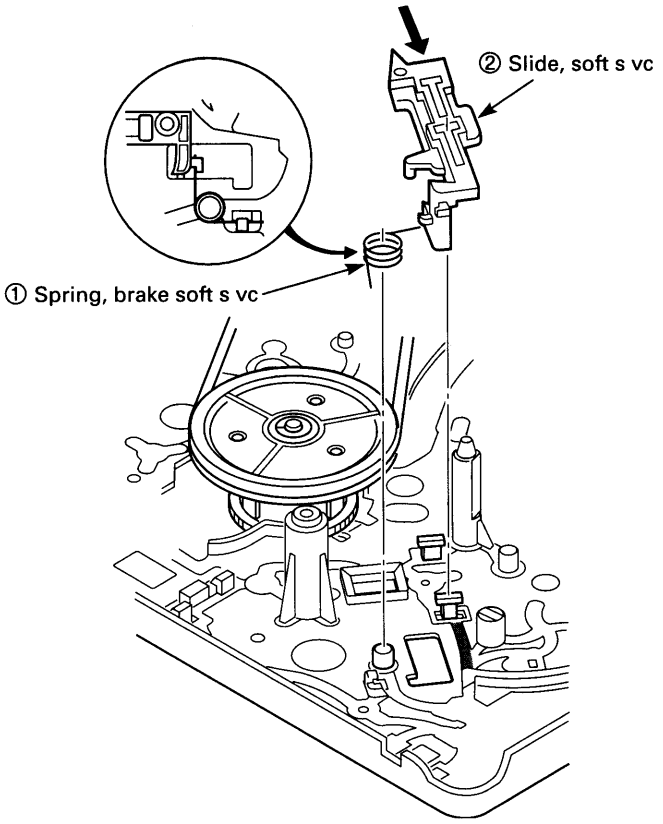


Fig. 4-15-1

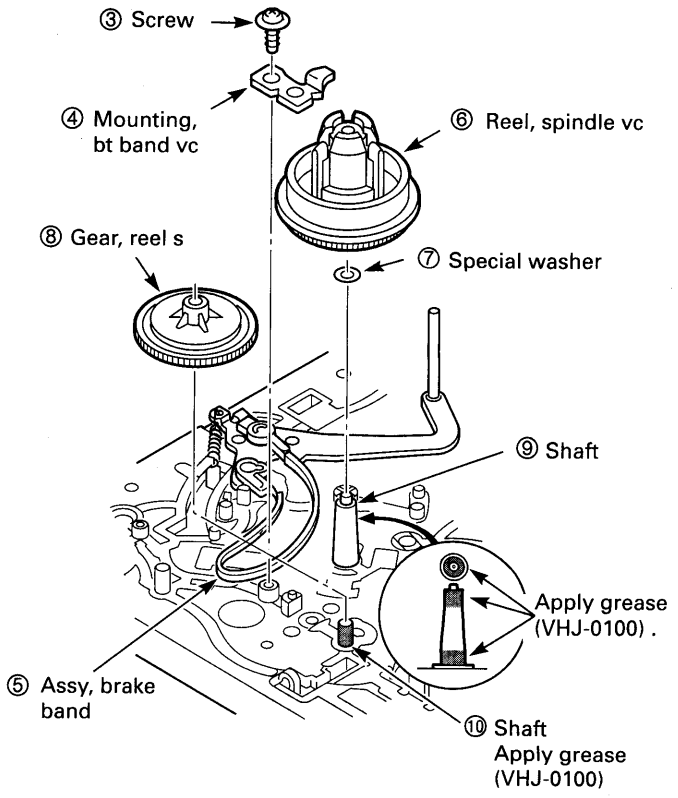


Fig. 4-15-2

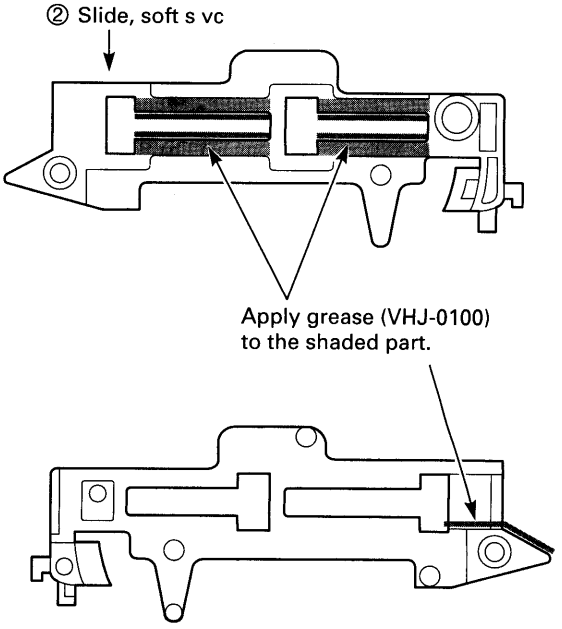


Fig. 4-15-3

4-16. ASSY PULLEY FRICTION VC, GEAR CLUTCH VC, LEVER CLUTCH VC (Refer to Fig. 4-16-1.)

1) Refer to 4-1, and remove the mechanism unit.
2) Remove the "belt, reel vc" ① at the bottom of the mechanism chassis. "
   Make sure no oil nor grease adheres to the side of the "belt, reel vc" ①.
3) Remove the "special washer" ②, and remove the "assy, pulley, friction vc" ③ and "spring, clutch vc" ④.
4) Remove the "washer" ⑤. And remove the "gear, clutch vc" ⑥, "special washer" ⑦, and "washer" ⑧.
   Note: Remove the "gear, clutch vc" ⑥ and "special washer" ⑦ in the assembled state.
   Normally, the "washer" ⑧ need not to be removed.
5) Remove the "spring, change clutch vc" ⑨, and remove the "lever, clutch vc" ⑩. Since "lever, clutch vc" ⑩ once removed deforms, it cannot be reused again. Do not attempt to remove it any valid reason.

PRECAUTIONS ON ASSEMBLY

1) If the "lever, clutch vc" ⑩ has been removed, be sure to replace with a new one.
2) While cleaning the shaft ⑪, apply a single drop of oil (VHJ-0099) to each layer at the top of the shaft ⑪.
3) Apply grease (VHJ-0100) evenly to the bottom side of the "special washer" ⑦.
4) Attach the "special washer" ⑦ so that it is firmly held in place by the three clamps at the top of the "gear, clutch vc" ⑥.

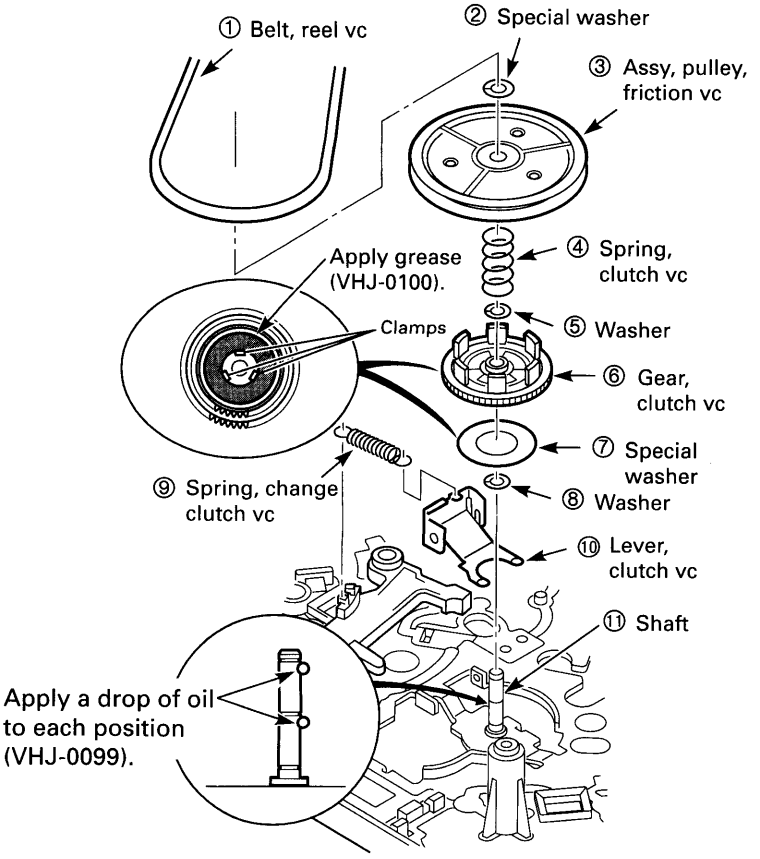


Fig. 4-16-1

4-17. LEVER CONTROL BRAKE VC, COMPL LEVER ACT BRAKE VC (Refer to Fig. 4-17-1.)

1) Refer to 4-1, and remove the mechanism unit.
2) Refer to Fig. 4-10, and remove the "gear, wheel 2", "gear, wheel 1", "gear, lock vc", and "cam, main vc".
3) Remove the "belt, reel vc".
4) Remove the clamp ② of the "lever, control brake vc" ①, then remove the clamp ③ of the outserter, and remove the "lever, control brake vc" ①.
5) Remove the "spring, return brake vc" ④ and "spring, change clutch vc" ⑤.
6) Remove the clamp ⑦ of the "compl, lever, act brake vc" ⑥ and clamp ⑨ of the shaft ⑧, and remove the "compl, lever, act brake vc" ⑥. Do not disassemble the "compl, lever, act brake vc" ⑥ to maintain the unit's performance.

PRECAUTIONS ON ASSEMBLY

1) Apply grease (VHJ-0100) to the shaft ⑧ and edge of the "compl, lever, act brake vc" ⑥.
2) Check that the clamp ② of the "lever, control brake vc" ① and clamp ⑦ of the "compl, lever, act brake vc" ⑥ are hooked to the mechanism chassis properly.

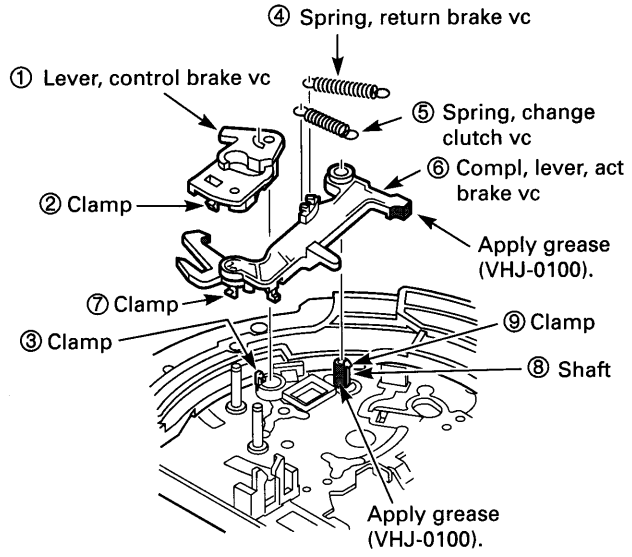


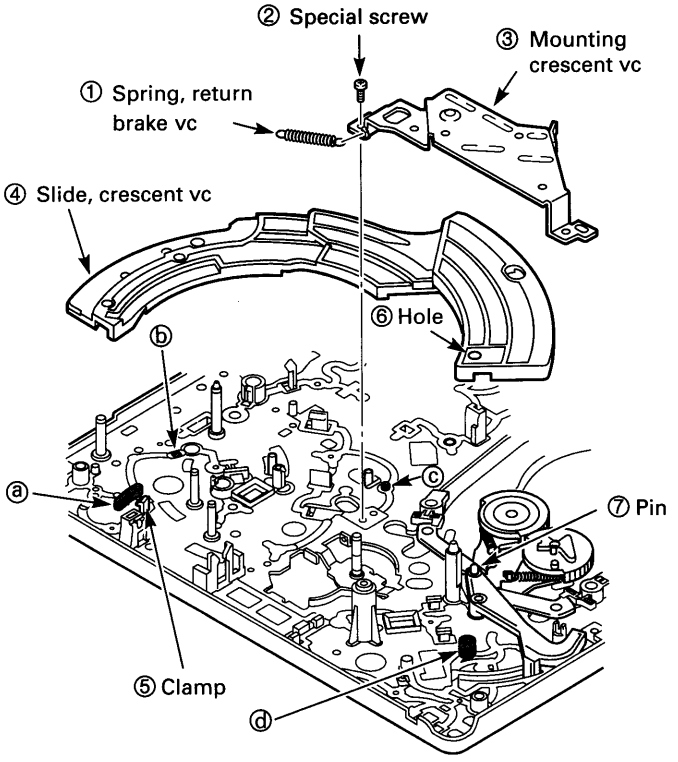
Fig. 4-17-1

4-18. SLIDE CRESCENT VC (Refer to Fig. 4-18-1, Fig. 4-18-2.)

1) Refer to 4-1, and remove the mechanism unit.
2) Refer to 4-2, and remove the "compl, cassette mecha vc".
3) Refer to 4-10, and remove the "gear, wheel 2", "gear, wheel 1", "gear, lock vc", and "cam, main vc".
4) Refer to 4-17, and remove the "lever, control brake vc".
5) Remove the "belt, reel vc".
6) Remove the "spring, return brake vc" ①.
7) Remove the "special screw" ②, and remove the "mounting crescent vc" ③.
8) Lift the right side of the "slide, crescent vc" ④ slightly, and slide the "slide, crescent vc" ④ to the right until it detaches from the clamp ⑤.

PRECAUTIONS ON ASSEMBLY

1) Apply grease (VHJ-0100) to the outserters ⓐ ⓑ ⓒ ⓓ of the mechanism chassis.
2) Apply grease (VHJ-0100) to the marked part ⓐ in Fig. 4-18-2, and grease (VHJ-0115) to the marked part ⓑ.
3) Refer to 4-20, and check that the "gear, load s" and "gear, load t" have completed tape unloading.
4) To attach, lift the right side of the "slide, crescent vc" ④ slightly, insert the left side in the clamp ⑤ first, and align the hole ⑥ with the pin ⑦ of the "assy, lever spring bt".
5) Tighten the screw ② with a 6 to 7 kg/cm torque.
6) After attaching, check that the levers and brakes operate normally.



Apply grease(VHJ-0100) to ⓐ, ⓑ, ⓒ, ⓓ.

Fig. 4-18-1

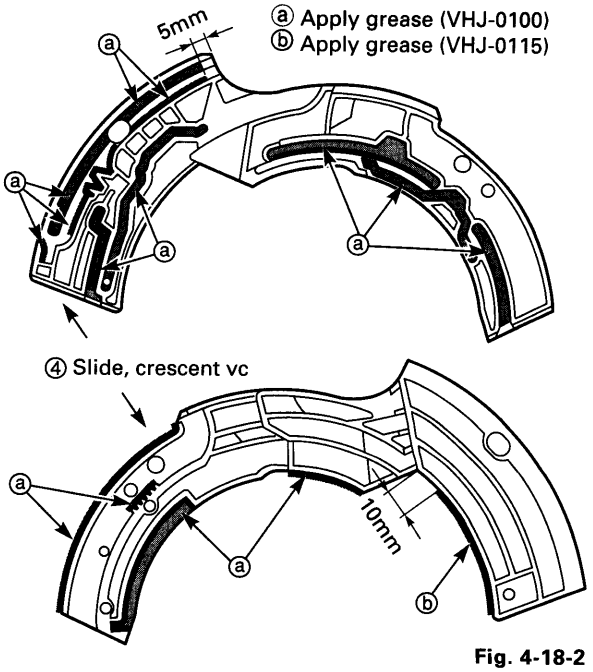


Fig. 4-18-2

4-19. ASSY LEVER SPRING BT (Refer to Fig. 4-19-1.)

1) Refer to 4-18, and remove the "slide, crescent vc".
2) Remove the "spring, bt" ① at the top of the mechanism from "assy, lever spring bt" ②.
3) Remove the "assy, lever spring bt" ② at the bottom of the mechanism.

PRECAUTIONS ON ASSEMBLY

1) Apply grease (VHJ-0100) to the shaft ③ and outserter.

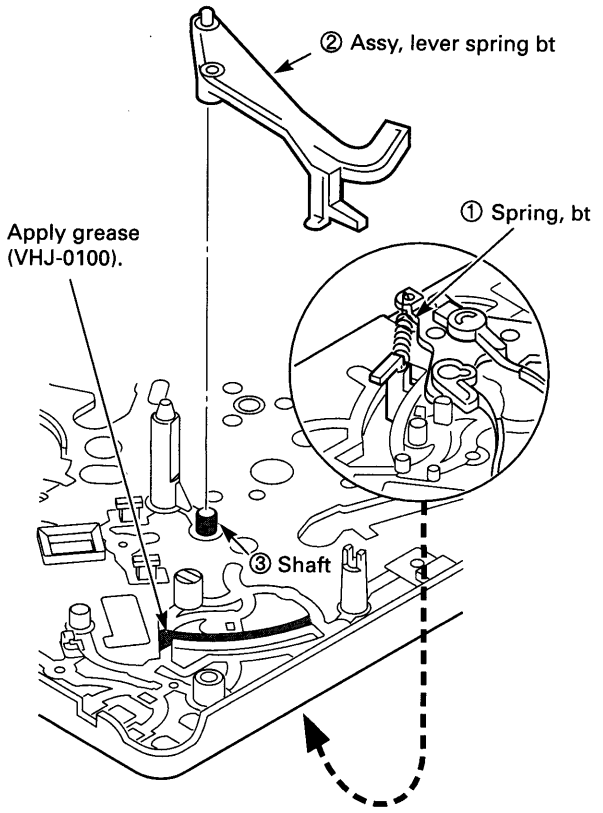


Fig. 4-19-1

4-20. GEAR LOAD S/T, ASSY LEVER LOAD S/T, MOUNTING INCL S/T GUIDE VC (Refer to Fig. 4-20-1 to 4-20-4.)

1) Refer to 4-13, and remove the "assy, brake s vc".
2) Refer to 4-12, and remove the "assy, lever bt".
3) Refer to 4-18, and remove the "slide, crescent vc".
4) Refer to 4-19, and remove the "assy, lever spring bt".
5) Press the tip of the "assy, mounting, incl s vc" ① and move it to the position shown in Fig. 4-20-1. Align it to the notch on the mechanism chassis, and remove the "assy, mounting incl s vc" ①. At this time, make sure that the "incline pin" of the "assy, mounting incl s vc" ① and the "assy, roller, guide" does not become dirty with the grease.
6) Press the tip of the "assy, mounting, incl t vc" ② and move it to the position shown in Fig. 4-20-1. Align it to the notch on the mechanism chassis, and remove the "assy, mounting incl t vc" ②. At this time, make sure that the "incline pin" of the "assy, mounting incl t vc" ② and the "assy, roller, guide" does not become dirty with the grease.
7) Refer to Fig. 4-20-2, remove the clamp ③, and remove the components of the "gear, load s" ④, "spring, load s" ⑤, and "assy, lever, load s" ⑥. As the clamp ① damages easily, take note to apply excessive force. When disassembling components, take care that the "spring, load s" ⑤ does not jump up.
8) Remove the components of the "gear, load t" ⑦, "spring, load t" ⑧, and "assy, lever, load t" ⑨. When disassembling components, take care that the "spring, load t" ⑧ does not jump up.

PRECAUTIONS ON ASSEMBLY

1) Apply grease (VHJ-0100) to shafts ⑩, ⑪, ⑫, ⑬ parts Ⓐ and Ⓑ. (Refer to Fig. 4-20-2.)
2) Apply grease to the top and bottom around the rail groove of the mechanism chassis, top of parts Ⓒ and Ⓓ of the cross section.
3) Apply grease to the components of the "gear, load s" ④ and "assy, lever, load s" ⑥, and components of the "gear, load t" ⑦ and "assy, lever, load t" ⑨. (Refer to Fig. 4-20-3.)
4) When assembling the "gear, load s" ④, "gear, load t" ⑦, "spring, load s" ⑤, "spring, load t" ⑧, "assy, lever, load s" ⑥, and "assy, lever, load t" ⑨, make sure that the spring hooks of the "gears, load s/t" ④ and ⑦ are protruding 0.5 mm from the plates of the "assy, lever, load s/t" ⑥ and ⑨.
5) Align the "gear, load s" ④ and "gear, load t" ⑦ to the respective marks. (Refer to Fig. 4-20-5.)
6) Apply grease (VHJ-0100) to the whole circumference of the guide boss of the "assy, mounting, incl s vc" ① and "assy, mounting, incl t vc" ②. (Refer to Fig. 4-20-6.)
7) Attach the "assy, mounting, incl s vc" ① and "assy, mounting, incl t vc" ② to the "assy, lever, load s" ⑥ and "assy, lever load t" ⑨ in the state shown in Fig. 4-20-1.
   After attaching, align the tip of the "assemblies, mounting, incl s/t vc" ① and ② to the marking line on the mechanism chassis.

8) After assembling, check if the tape loading and tape unloading operations are performed properly.
9) After assembling, clean the "incline pin" and "assy, roller, guide" of the "assy, mounting, incl s vc" ①, and "incline pin" and "assy, roller, guide" of the "assy, mounting, incl t vc" ②.

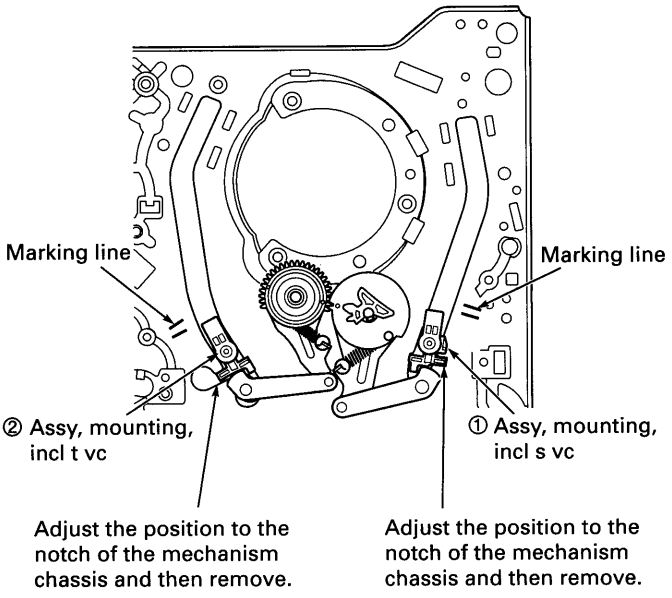

Marking line
Marking line
② Assy, mounting, incl t vc
① Assy, mounting, incl s vc
Adjust the position to the notch of the mechanism chassis and then remove.
Adjust the position to the notch of the mechanism chassis and then remove.

Fig. 4-20-1

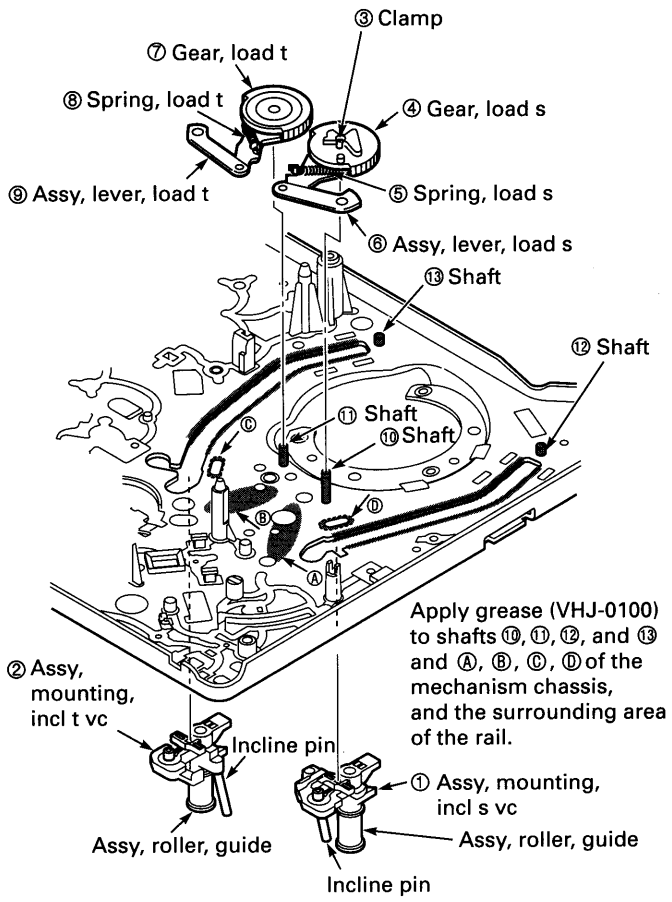
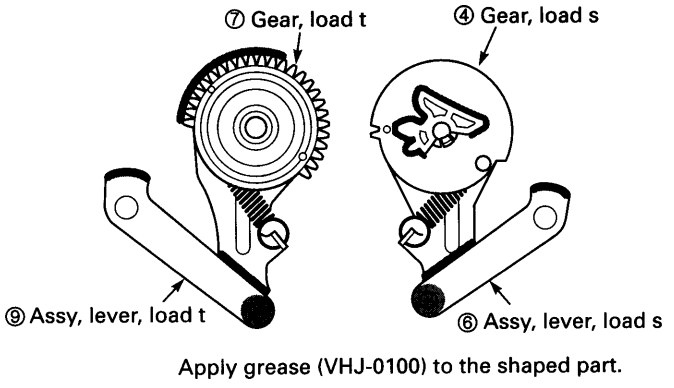

③ Clamp
⑦ Gear, load t
⑧ Spring, load t
④ Gear, load s
⑨ Assy, lever, load t
⑤ Spring, load s
⑥ Assy, lever, load s
⑬ Shaft
⑫ Shaft
⑪ Shaft
⑩ Shaft
Apply grease (VHJ-0100) to shafts ⑩, ⑪, ⑫, and ⑬ and Ⓐ, Ⓑ, Ⓒ, Ⓓ of the mechanism chassis, and the surrounding area of the rail.
② Assy, mounting, incl t vc
Incline pin
① Assy, mounting, incl s vc
Assy, roller, guide
Assy, roller, guide
Incline pin

Fig. 4-20-2



Apply grease (VHJ-0100) to the shaped part.

Fig. 4-20-3

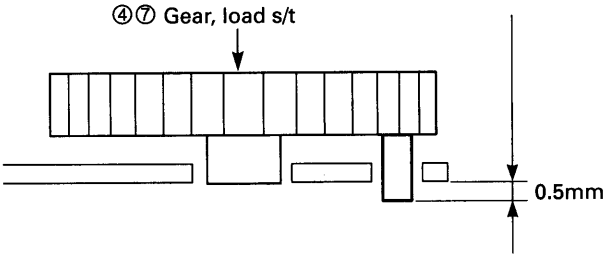


Fig. 4-20-4

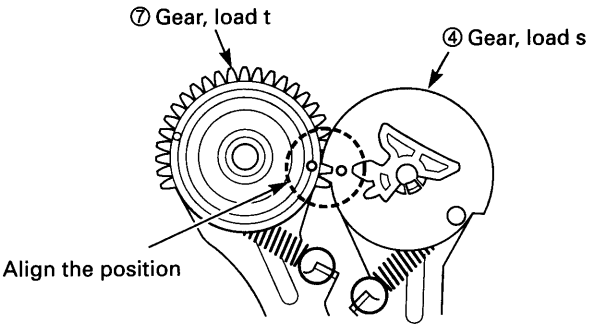


Fig. 4-20-5

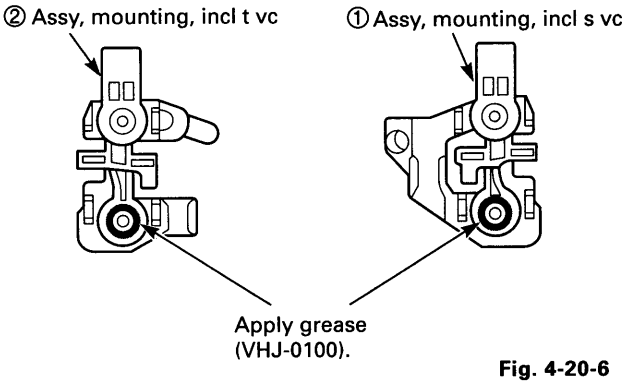


Fig. 4-20-6

4-21. ASSY ROLLER GUIDE (Refer to Fig. 4-21-1.)

1) Rotate the "assy, roller, guide" ① in the counterclockwise direction and remove.

PRECAUTIONS ON ASSEMBLY

1) After assembling, clean the "guide roller" and perform "5-3. Adjusting Tape Path".

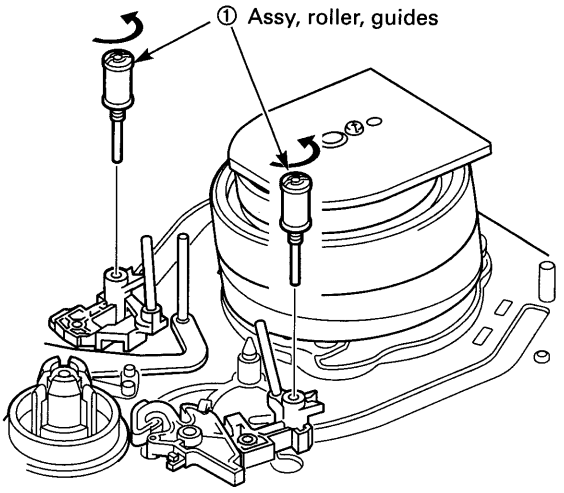


Fig. 4-21-1

4-22. SPRING EARTH VC (Refer to Fig. 4-22-1.)

Note: Some models may not be attached with a "spring, earth vc" ②.

1) Remove the "special screw" ①, and remove the "spring earth vc" ②.

PRECAUTIONS ON ASSEMBLY

1) Tighten the "special screw" ① with a 6 to 7 kg/cm torque.
2) After attaching, check that the tip of the shorter "spring, earth vc" ② is inside the hole ③ and that the longer one is parallel to the right edge of the mechanism chassis.

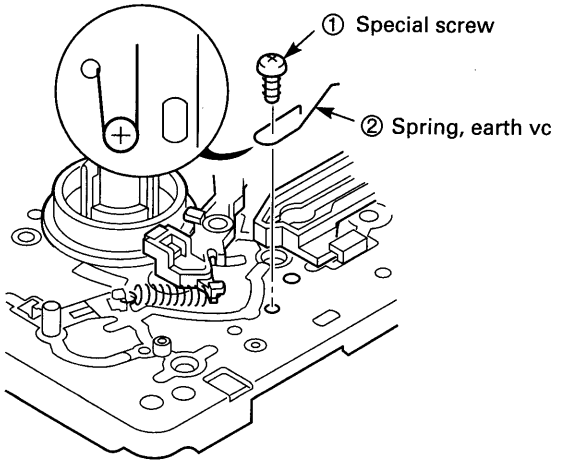


Fig. 4-22-1

4-23. SPRING GUIDE EARTH VC, GUIDE S VC (Refer to Fig. 4-23-1.)

Note: Some models may not be attached with a "spring, guide earth vc" ①.

1) Remove the tip of the "spring, guide earth vc" ① from the hole ② and pull it out.
2) Remove the clamp ③, and remove the "guide, s vc" ④.

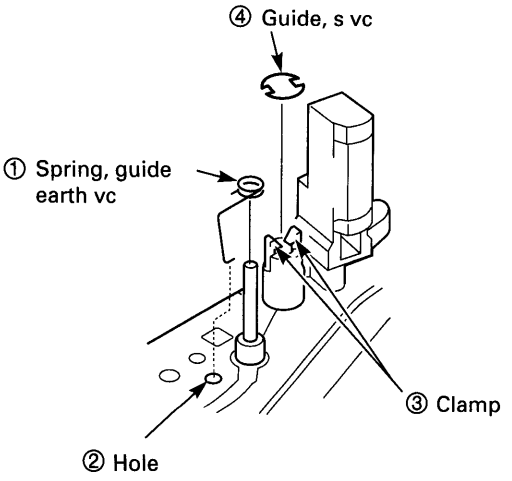


Fig. 4-23-1

5. CHECKING AND ADJUSTING THE MECHANISM

5-1. CHECKING THE REEL TORQUE VALUE (Refer to Fig. 5-1-1, Fig. 5-1-2)

1) With the power switch set to "Off", stick a black vinyl tape over the tape sensors. Then set the power switch to "On". As front loading starts, refer to Fig. 4-1-1 of section 4-1, release the lock of the "lever, lid opener vc", and lower the "tray, vc".
   Note:
   1. Measure in a place where no incandescent light and external light is present.
   2. If the PLAY, FF, and REW mode cannot be set using the above 1) method, create the dummy cassette tape shown in Fig. 4-1-2. On the dummy cassette tape, remove the reels and spring plates of the supply and take up sides, and open holes equivalent to the reel hub diameter on the top.
2) For this mechanism, after inserting the cassette, when the mode is set for the first time to REW or FF, the reel will not rotate with the normal REW/FF mode torque for the first 5 seconds because tape remainder detection is performed. For this reason, when setting to the REW mode or FF mode for the first time after the "tray, vc" descends, continue rotating the reel table of the take up or supply side for about 5 seconds. After the mode changes to REW or FF, set the mode to STOP once.
   Then perform the check in step 2) or 3).
3) In the STOP state, install the torque dial gauge (VHJ-0004) to the supply side reel, press the REW button, and check that the torque of the supply side reel is above 650 g/cm.
   Measure holding the torque dial gauge (VHJ-0004) with your hand (lock torque).
4) In the STOP state, install the torque dial gauge (VHJ-0004) to the take up side reel, press the FF button, and check that the torque value of the take up side reel is above 650 g/cm (lock torque).
5) After setting to the PLAY mode, measure the torque of the take up side reel after 10 seconds, and check that it is within the range of 60 to 110 g/cm (lock torque).
6) Press the REW button in the PLAY mode, and set to the R-SEARCH mode. At this time, measure the torque of the supply side reel, and check that it is 115 to 180 g/cm (lock torque).

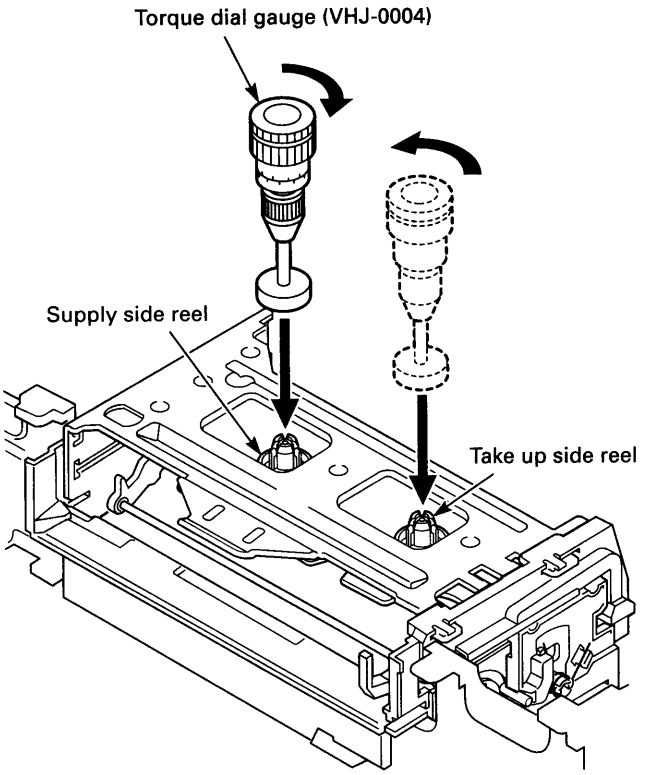


Fig. 5-1-1

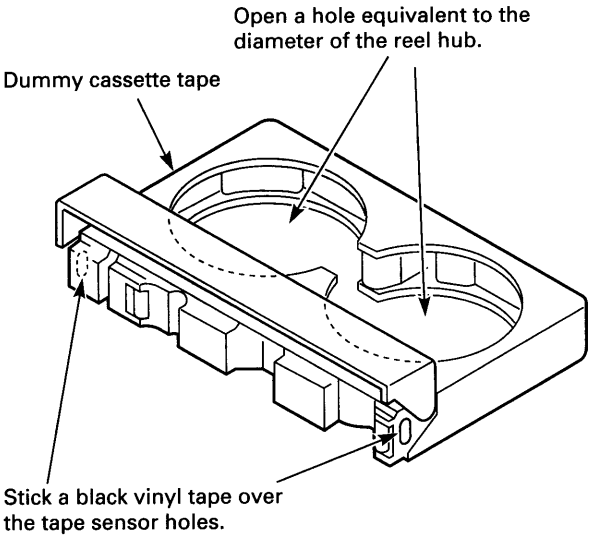

Open a hole equivalent to the diameter of the reel hub.
Dummy cassette tape
Stick a black vinyl tape over the tape sensor holes.

Fig. 5-1-2

5-2. ADJUSTING THE ASSEMBLY LEVER BT POSITION AND CHECKING THE BACK TENSION TORQUE DURING PLAY MODE

5-2-1. ADJUSTING THE ASSEMBLY LEVER BT POSITION (Refer to Fig. 5-2-1.)

1) Set to the PLAY mode without inserting the cassette tape, or insert the dummy cassette tape, and set to the PLAY mode.
   Check that the tip of the "assy, lever, bt" is between the two lines of the mechanism chassis.
2) If it is not between the two lines, set to the EJECT mode, and rotate part A of the "assy, brake, band" to adjust. Rotating part A in the clockwise direction moves the tip of the "assy, lever, bt" to the left while rotating it in the counterclockwise direction moves it to the right.
3) Refer to section 5-2-2, and check that the back tension torque is within the range of 30 to 50 g/cm.

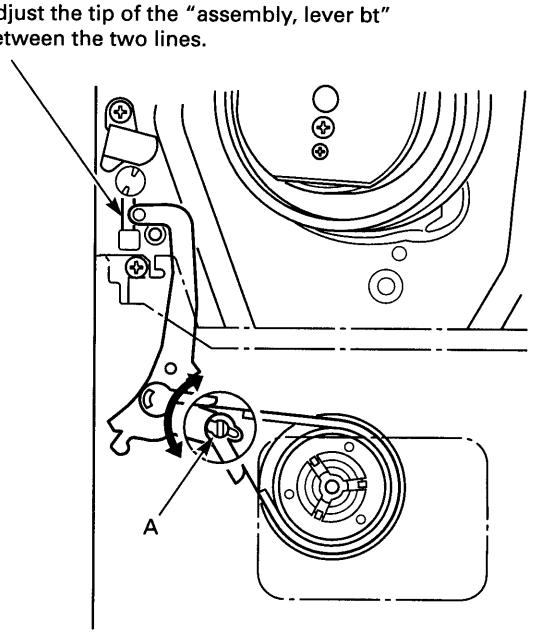


Fig. 5-2-1

5-2-2. CHECKING THE BACK TENSION TORQUE DURING PLAY MODE

1) Load the cassette torque meter (VHJ-0016) and set the PLAY mode.
2) Check that the back tension torque is within the range of 30 to 50 g/cm.

5-3. ADJUSTING TAPE PATH

Normally, the tape path system need not be adjusted, but when the parts shown in Fig. 5-3-1 have been removed or replaced, check and adjust tape path. Adjust while observing the envelope waveform of the video head output on the oscilloscope. Also check that the tape smoothly comes out from the reel and runs along the tape guides and cylinders (drum) naturally. It is important to observe the tape guides visually.

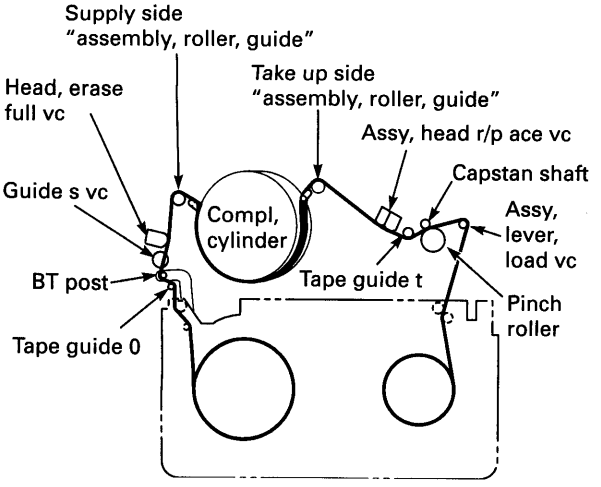


Fig. 5-3-1

5-3-1. PREPARING FOR ADJUSTMENTS

1) Select a PAL or NTSC alignment tape or blank cassette tape, according to the transmission system of the VCR you are repairing.
   NTSC: For models with 525 scanning lines and a field frequency of 60 Hz.
   PAL: For models with 625 scanning lines and a field frequency of 50 Hz
2) Clean the tape guides, "compl, cylinder XXXX" (drum), capstan shaft, "assy, head r/p ace vc" (ACE head), and "head, erase full vc".
3) Use an oscilloscope for adjusting the height of the "assy, roller, guide" and tracking (X value)/azimuth of the "assy, head r/p ace vc" (ACE head). To observe the envelope waveform, connect the CH-1 probe to the test point for envelope waveform, and connect the CH-2 probe to the test point for the switching pulse (SW P).
   While adjusting tape path, trigger the LOW side of the switching pulse (SW P) to observe the CH-1 side output waveform of the video head.
   Note: The connecting parts of the oscilloscope differ according to the mode. For details, refer to "Test point for tape path adjustment" in the section on electrical circuit adjustments of the service manual.
4) When checking the tape path state visually, use a dental mirror.

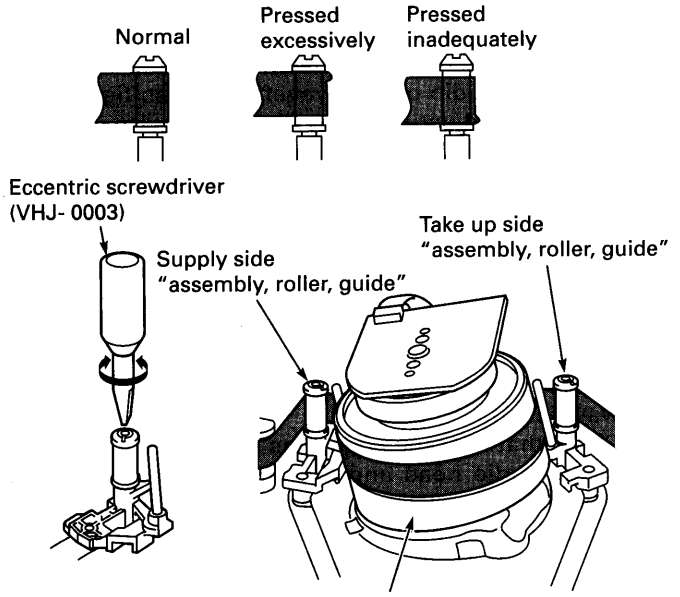
5-3-2. ADJUSTING THE GUIDE ROLLER (Refer to Fig. 5-3-2 and Fig. 5-3-3.)

(1) Play the alignment tape (NTSC:VHJ-0006, PAL:VHJ-0009) and check that the envelope waveform has become maximum using the tracking center. Then rotate the "assy, roller, guide" of the supply and take up sides in the counterclockwise direction to loosen them, and then tighten them alternately until the envelope waveform becomes flat. If the envelope waveform is not maximum at the tracking center, refer to section 5-3-3, and temporarily adjust the "tracking (X value)" of the "assy, head r/p ace vc".
Note: Pressing the "CHANNEL + (▲)" and CHANNEL – (▼) tracking buttons together resets to the tracking center.

(2) Adjust the "assy, roller guide" at the supply side.
1) Press the tracking button (channel – (▼)), and check that when the envelope waveform is set to the maximum 30 to 50%, the first half of the envelope waveform is not flat.
If not flat, finely adjust the "assy, roller guide" of the supply side according to the following procedure.
a. If the first half of the envelope waveform is as shown in Fig. 5-3-3 (a), as the "assy, roller, guide" of the supply side is pressed excessively, loosen the "assy, roller, guide" of the supply side to set the state shown in Fig. 5-3-3 (b), tighten again until the position that the envelope waveform becomes flat.
b. If the first half of the envelope waveform is a radial shape as shown in Fig. 5-3-3 (c), tightening the "assy, roller, guide" of the supply side even further will not correct the radial shape as shown in Fig. 5-3-3 (d). In some cases, the flat part will bend in. In such cases, since the state shown in Fig. 5-3-3 (c) is normal, loosen the "assy, roller, guide" of the supply side, and tighten again until the envelope waveform becomes as shown in Fig. 5-3-3 (c).
2) Check that the output of the first half of the envelope waveform is below 80% of the maximum part at the tracking center.
3) Rotate the "assy, roller, guide" of the supply side in the counterclockwise direction by 20°.

(3) Adjust the "assy, roller, guide" of the take up side.
1) Press the tracking button (channel – (▼)), and check that when the envelope waveform is set to the maximum 30 to 50%, the latter half of the envelope waveform becomes flat. If not flat, slightly loosen the "assy, roller, guide" of the take up side, and then slightly tighten until it becomes flat.
2) Check that the output of the latter half of the envelope waveform is maximum at the tracking center. If not maximum, finely adjust the "assy, roller, guide" of the take up side.

(4) When set to F-SEARCH → PLAY, R-SEARCH → PLAY, check that the envelope waveform does not change.
1) If the first half of the envelope waveform changes, tighten the "assy, roller, guide" of the supply side in the clockwise direction by up to 20°.
2) If the latter half of the envelope waveform changes, adjust the "assy, roller, guide" of the take up side of step (3) again.



Adjust so that the tape path along the cylinder lead face.

Fig. 5-3-2

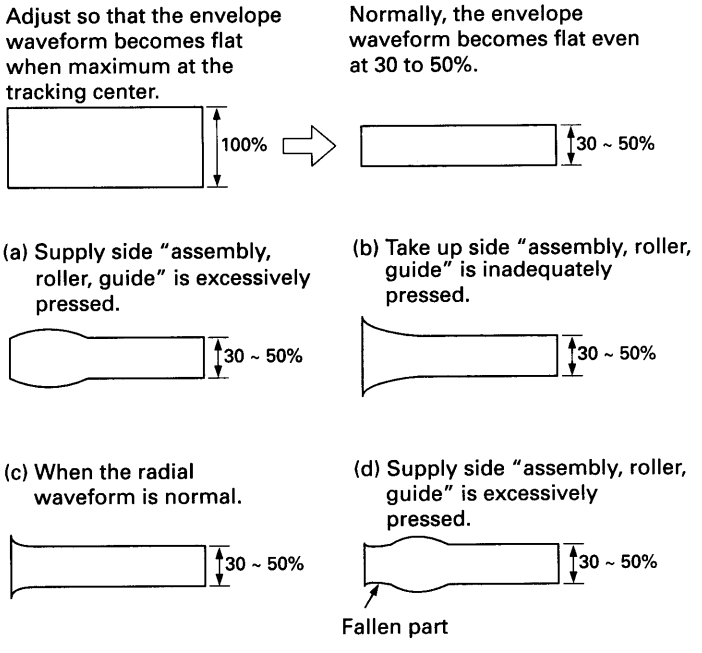

Adjust so that the envelope waveform becomes flat when maximum at the tracking center.
100%
Normally, the envelope waveform becomes flat even at 30 to 50%.
30 ~ 50%
(a) Supply side "assembly, roller, guide" is excessively pressed.
30 ~ 50%
(b) Take up side "assembly, roller, guide" is inadequately pressed.
30 ~ 50%
(c) When the radial waveform is normal.
30 ~ 50%
(d) Supply side "assembly, roller, guide" is excessively pressed.
30 ~ 50%
Fallen part

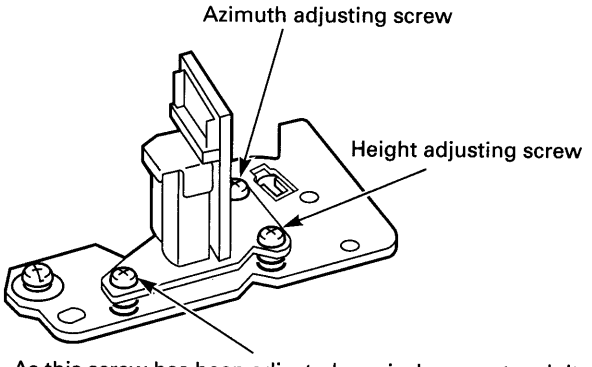
Fig. 5-3-3

5-3-3. ADJUSTING THE ASSY HEAD R/P ACE VC (ACE HEAD), HEIGHT, AZIMUTH, TRACKING (X VALUE) (Refer to Fig. 5-3-4.)

(1) Adjusting the height and azimuth
(Refer to Fig. 5-3-4.)

1) Play the alignment tape (NTSC:VHJ-0005, PAL:VHJ-0008), and observe the audio output waveform on the oscilloscope.
2) Loosen the height adjusting screw in the counterclockwise direction, and decrease the amplitude of the audio output waveform. In this state, tighten the height adjusting screw in the clockwise direction, and maximize the amplitude of the audio output waveform. Then tighten the height adjusting screw in the clockwise direction slowly, and decrease the amplitude of the audio output waveform. Next, loosen the height adjusting screw in the counterclockwise direction slowly and stop when the amplitude of the audio output waveform starts to become maximum.
3) Play the alignment tape (NTSC:VHJ-0006, PAL:VHJ-0009), and observe the audio output waveform on the oscilloscope. Rotate the azimuth adjusting screw, and maximize the amplitude of the audio output waveform.
4) Check that the tape edge runs between the top edge of the audio head and bottom edge of the control head. Make sure that spaces A and B are the same.

Note: Rotate the height adjusting screw using a slotted screwdriver during adjustments, but do not apply force in the vertical direction.
Rotate the height adjusting screw slowly as it also adjusts tilt, and be careful not to rotate excessively. Never touch screws other than the height adjusting screw and azimuth adjusting screw as they are adjusted precisely at shipment. If they are touched, malfunctions, etc. may result.



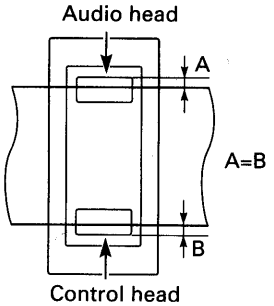


Fig. 5-3-4

(2) Adjusting tracking (X value) (Refer to Fig. 5-3-5.)

1) Play the alignment tape (NTSC:VHJ-0006, PAL:VHJ-0009).
2) Press the tracking buttons (channel + (▲) and – (▼)) together, and reset to the tracking center.
3) Observe the envelope waveform of the video head output using the oscilloscope.
4) Loosen the fixing screw of the "assy, head r/p ace vc" (ACE head) in the counterclockwise direction by 20° to 30°.
5) Adjust the position of the "assy, head r/p ace vc" (ACE head) using a slotted screwdriver.
Tighten the fixing screw of the "assy, head r/p ace vc" (ACE head) at the position where the amplitude of the envelope waveform becomes maximum at the tracking center.
Check that when the tracking is changed by pressing the tracking button in the plus direction (▲) or minus direction (▼), the envelope waveform changes evenly, etc.
6) Play the alignment tape (NTSC:VHJ-0007, PAL:VHJ-0052), and check that the amplitude of the envelope waveform becomes maximum at the tracking center. If not maximum, repeat steps 1) to 6).
7) Refer to the section on electrical adjustments in the service manual, and perform "adjust the switching position" of the servo circuit.

Note: For multi-system models, perform the same adjustments for the PAL model, and then play the alignment tape for NTSC, and check that the envelope waveform becomes more or less maximum at the tracking center. If not maximum, perform the adjustment for PAL models again.

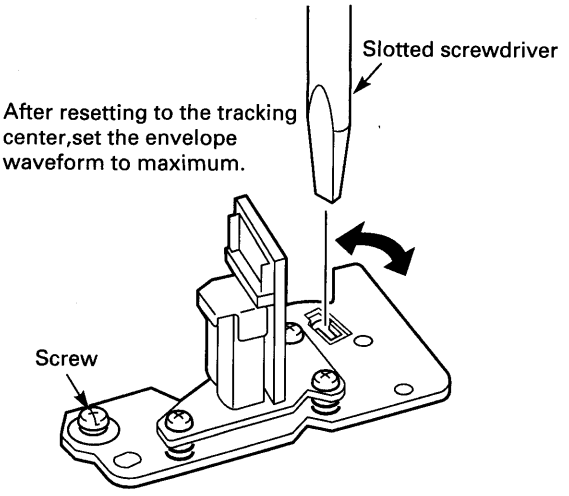


Fig. 5-3-5

5-3-4. CHECK AFTER ADJUSTMENTS (Refer to Fig. 5-3-6.)

1) Play the alignment tape (NTSC-VHJ-0006, PAL:VHJ-0009), and check that the envelope waveform rises immediately, and that the envelope waveform and audio output waveform do not change.
2) Load the cassette tape (NTSC:T-120, PAL:E-180), and record and play. Check that the envelope waveform rises immediately, and that the envelope waveform and audio output waveform do not change. (Input 1 KHz to the audio input terminal during recording. Use an unscratched cassette tape. Also check that when set to the tracking center, decrease of the first and second half is below 20% from the maximum amplitude of the envelope waveform.)
3) After setting to PLAY → R-SEARCH, R-SEARCH → PLAY, check that the envelope waveform rises immediately. Also check that the tape does not slack near the pinch roller.
4) When set to PLAY from the modes FF, REW, F-SEARCH, R-SEARCH, STOP, check that the envelope waveform rises immediately. Also check that the tape does not slack near the pinch roller.
5) Check that during the PLAY, FF, REW, F-SEARCH, R-SEARCH modes, the tape does not curl nor ride over the upper and lower flanges of the tapes guides.
6) Check that the tape runs as shown in Fig. 5-3-6 during PLAY.
7) Load the cassette tape (NTSC:T-160, PAL:E-240), and record and play. Repeat and Check the steps 3) to 5) again.

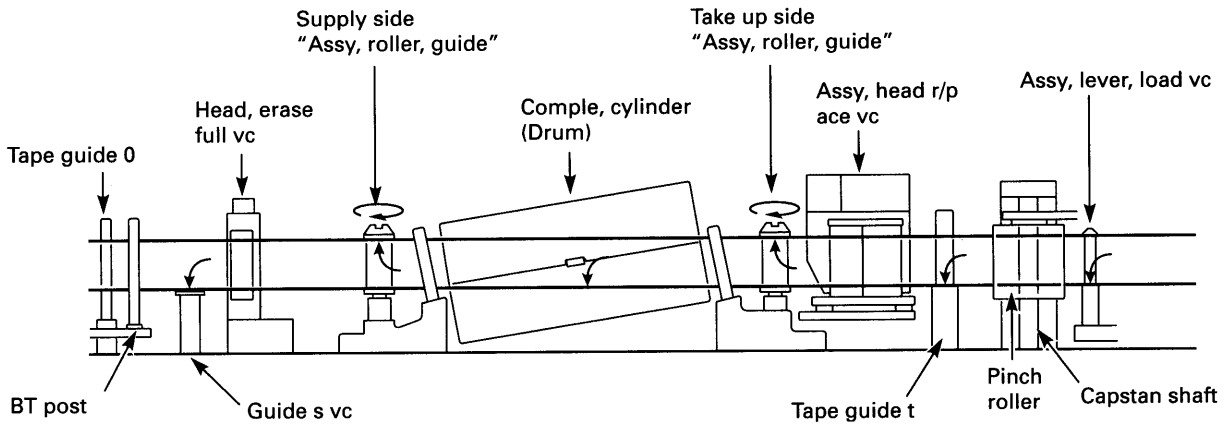


Fig. 5-3-6

Feb./'99/11520 SU Printed in Japan

SANYO Electric Co., Ltd.
Osaka, Japan